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RURAL HOUSING

A DRAFT MANUAL

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PRINCIPAL, TRAINING CENTRE FOR VILL...
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Foreword

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The illustrations in this booklet represent an attempt to visualise what our villages can look like if proper attention is paid to design and detail. What is more, the Manual shows how costs of construction can be kept low if the principle of aided self-help is invoked in the matter of Rural Housing. Local building materials and the local skills that exist in all our villages will have to be harnessed in this attempt to improve the standards of housing in our rural areas.

To the workers of the Community Projects Administration, who have dedicated themselves to the cause of rural housing, this manual, I have no doubt, will come in most handy, and I trust that it will also suggest to them the further lines on which activities might, with advantage, proceed in the countryside.

Swaran Singh

NEW DELHI;
6th Sept., 1954 } *Minister for Works, Housing and Supply.*

... Training Centre for Villa[ge] ...
6 - APR 1955
Gandhigram

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Introduction

Attempts to prescribe the layout of the villages and the types of houses which should be built there is likely to bring on the head of the planner the opprobium of those who, disgusted at the dull and uniform array of city structures, do not want the countryside to repeat the same experiment. Yet the romance and the simplicity of the countryside has often been overrated ; their existence today, unfortunately, is only in one's imagination and a visit to any village will show how far-removed it is from what one has traditionally thought it to be—a place of cosy little cottages, clean and healthy living. That it was once a place exactly like what we have all along been taught to believe, is the reason why attempts should now be made to bring it closer to the village of one's dreams and to restore it to that original position from which it has fallen long ago.

An attempt has, therefore, been made by the Ministry of Works, Housing and Supply in conjunction with the Community Projects Administration, in this booklet, to draw up simple layouts for the villages and to suggest the type of houses that can be built, so that in the final result there can be clean, sanitary and healthy villages throughout the country. These layouts and plans should however, be considered as indicative, as it is extremely unwise to recommend or follow standard plans for such a large country like India with varying climates and habits, requirements, and customs of the people.

Different materials available in different localities necessitate a flexible approach in the matter of specifications and construction methods to encourage use of local materials as far as possible. These plans, therefore, will have to be judiciously modified according to local requirements and resources.

In prescribing the layouts and type designs, care has been taken to see that the cost of construction is as low as possible and that the construction technique itself is such that the houses and the other buildings recommended in the booklet can be built by the labour of the villager, his family and friends. The stress, therefore, throughout is on aided self-help housing. The houses, furthermore, have been so designed as to provide initially the minimum requirements of the family, with provision for later extensions as the size and needs of the family increase.

A typical house in Assam and areas with very heavy rainfall. The house is raised on wooden parts so as to avoid moisture.

This is exact replica of Mahatma Gandhi's hut of Sevagram constructed at the Exhibition. Note the use of local materials and a very small window which is eminently suitable for a climate of Wardha. A large verandah can be used during the monsoon months and mornings and evenings, while the rooms with mud walls, country tile roof and small windows would be very comfortable during the hotter part of the day.

2. HOUSES FOR DIFFERENT REGIONS

The climate and the availability of materials varies with the three distinct zones of India, namely, the plains of the North ; the Coastal regions which include Bombay, Calcutta and Madras and the hilly areas. It has been necessary, therefore, to evolve three different types of designs in this booklet.

In most parts of North India, the summers are hot, the winters cold and the rainfall low. Due to extreme variations in temperature, the construction has necessarily to be heavy for comfort in summer and winter. As good earth is generally available, construction may be of burnt bricks or stabilised mud walls.

In the coastal areas, the climate is hot and humid with a higher rainfall than in the North. In most of the coastal regions and in the South, bamboos, ballies and palmira and local timber are fairly cheap. Therefore, light structures using these materials with a sloping roof are recommended for these areas.

For the hilly regions where the climate is temperate but rainfall is heavy, it is essential that water-proof roofs are provided and the plinth of the building kept sufficiently high to keep away the moisture. The houses can either be elevated on wooden posts as is done in Assam, or constructed on *pucca* masonry plinth sufficiently high to avoid dampness. The roof has to be sloping with tiles manufactured locally or G. I. or asbestos sheets whichever is within the means of the builder.

3. TYPE OF WALL CONSTRUCTION

In all the three zones, the pillar and panel type of construction would be suitable for the villages. The pillars can be of brick or stone though wooden or precast concrete posts can also be used wherever possible. In the North the panels may be of stabilized earth or sun-dried bricks and in coastal regions of woven bamboo or ordinary *chatai* matting. These could be replaced by burnt bricks later when funds permit. The load of the roof, which may be flat or sloping, depending upon the requirements, is taken by the pillars and therefore any type of *kutcha* panels which can be devised by the farmer himself will not endanger the structure.

A farmer's house built with local materials and labour of his family. The thick mud walls keep the house comfortable during the summer. A good sloping roof gives adequate protection from weather.

A typical hut with a palmira thatch roof. This type of roof is very popular in South India and coastal regions.

The roof is one of the most expensive and difficult items of construction in a rural house. In North India, bricks are available at a reasonable cost and a flat roof is preferable to a sloping one. Therefore, the cheapest and the most convenient type of roof is made of flat bricks supported on wooden or precast concrete battens. The insulation and water-proofing course can be made up of 3" to 4" thick layer of mud and *bhoosa* laid to a slope.

In coastal regions and in hilly areas, a sloping roof is necessary due to heavier rainfall. The framework of the roof may be of *ballies* or bamboos. The roof covering may be of country tiles, asbestos or G. I. sheets.

4. FLOORING AND WALL PROTECTION

To economise on cost, the flooring of the whole house except the kitchen and the washing-place may be of stabilised earth treated with cow-dung. In the kitchen and the washing place *pucca* flooring with cement or stone slabs is necessary.

It is necessary to protect the exposed surfaces of the *kutcha* walls from heavy rains during monsoons. In buildings, where a sloping roof has been provided, a reasonably good protection can be given by extending the eves and by keeping the side-walls not too high. The Karnal Soil Research Laboratory (East Punjab) is evolving a plaster with a mixture of mud and 5% bitumen emulsion. It is reported to be water-proof and seems to be an answer for protecting mud walls from rain.

Doors and windows can be of local wood. To keep the cost low on these items, it would be necessary to design a house in such a manner that the minimum number of doors and windows are provided, subject to requirements of light and ventilation.

This house is quite suitable for areas where good soil is available. The walls can be in mud or sun-dried bricks. The plaster would require attention before and after monsoons.

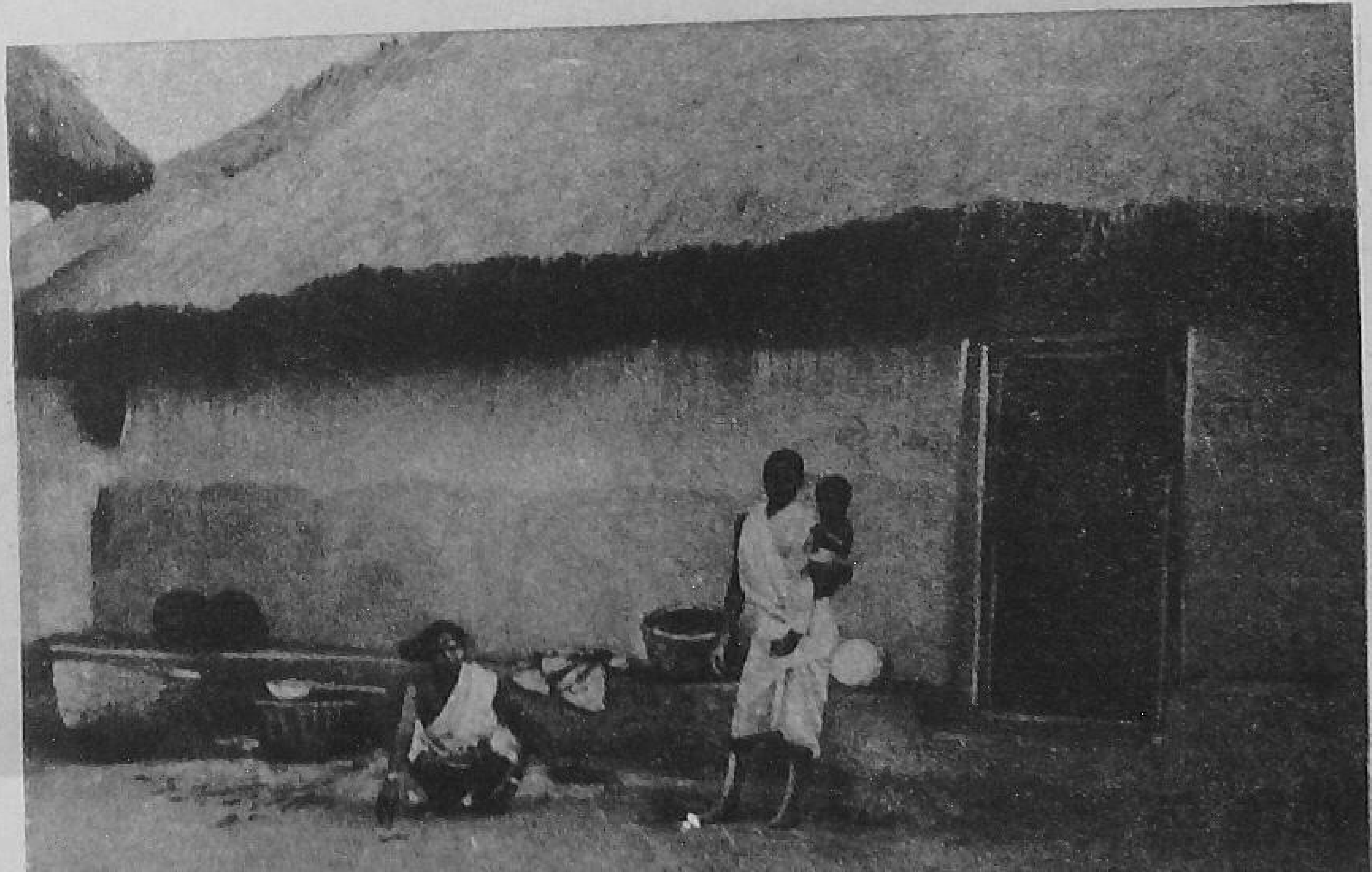
5. SINGLE-STOREYED HOUSES NEEDED

As land is not expensive in rural areas, single-storeyed construction is desirable. A proper and big courtyard in front, as well as in the rear of the house, is necessary for erecting the cattle-shed, storage for fodder and food-grains.

In the rural areas, families are large and married sons stay with their parents for quite a long period. The social pattern is such, that there is a segregation of sexes. It is, therefore, necessary to provide a certain measure of privacy and adequate working space for women.

6. ENVIRONMENTAL HYGIENE

The arrangement of houses in a village is important, for though the individual houses are kept fairly clean, the standard of environmental hygiene is rather low. The village well, due to inadequate arrangements for drainage, becomes a dirty place and water stagnates, making it a fertile ground for breeding mosquitoes. With proper drainage arrangements, the village-well can become a fine community centre, where women can meet, chat and relax while doing their work. Similarly, the location of the village school, the *panchayatghar* and other community facilities are also extremely important. There is no justification for overcrowding the houses in the rural areas, where land is not so expensive. At the same time, adequate precaution in planning is necessary so as not to spread out the houses to such an extent that the provision of services, like roads, paths and drains becomes an expensive affair. This can be achieved by designing houses in rows for the low and middle classes and semi-detached houses for the upper classes. The detached houses should be an exception rather than the rule.



A typical hut of aborginal tribes in Bihar. Note the general cleanliness. With slight improvements like providing one or two small windows, pucca floor for kitchen etc. This house could be made very suitable and comfortable.

GENERAL SPECIFICATIONS FOR RURAL HOUSES

The following specifications are recommended for the rural houses :—

Foundation & Plinth :—The width and depth of foundation will depend upon the nature of soil at different places. Stabilised soil using 2·5% cement in foundation and plinth or brickwork in mud over 6″ lime concrete.

Damp proof Course :—1″ thick D. P. C. 1:2:4 (1 cement:2 sand: 4 stone ballast ½″ gauge).

Superstructure :—Burnt brick or stone in mud mortar or pillars with burnt brick, stone, wood or precast concrete with panels of sundried bricks, rammed earth, mud, woven bamboo, or *chatai* matting.

Doors and windows :—Soft wood or other local wood battened and braced doors and windows with 3″×4″ frames with iron fittings.

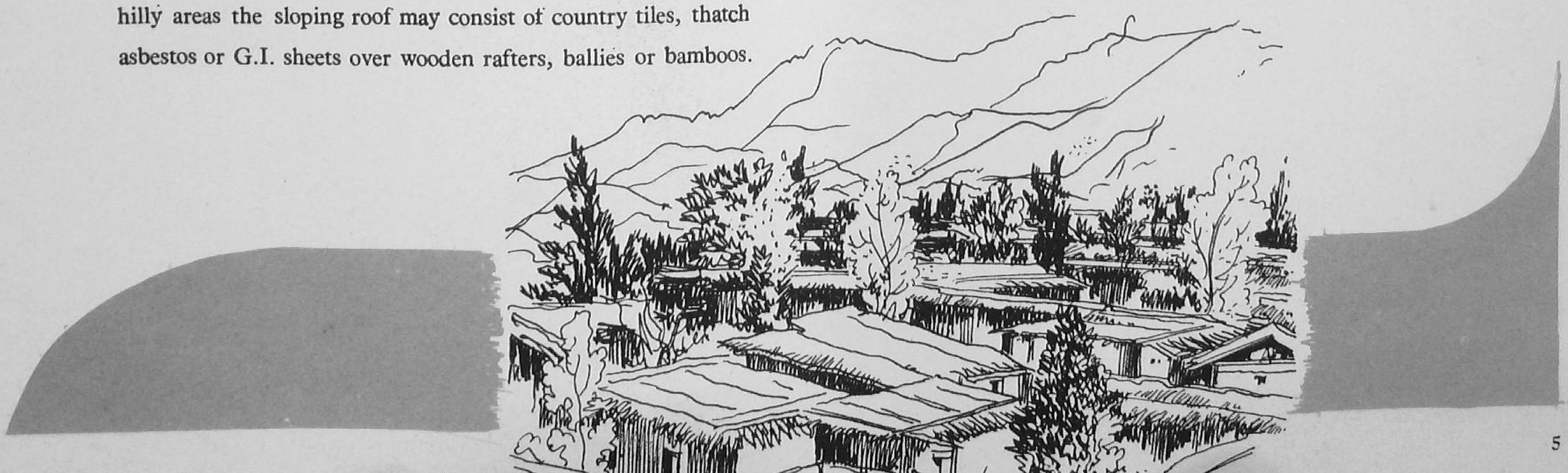
Roofing :—The flat roof may be of wooden or concrete rafters topped with brick or stone tiles 12″×6″×2″ and covered with 4″ mud *phuska* laid to slope for Northern India. In coastal and hilly areas the sloping roof may consist of country tiles, thatch asbestos or G.I. sheets over wooden rafters, ballies or bamboos.

Flooring :—The flooring of the rooms may be of stabilised earth. The kitchen bath and cattle shed should have cement concrete floor.

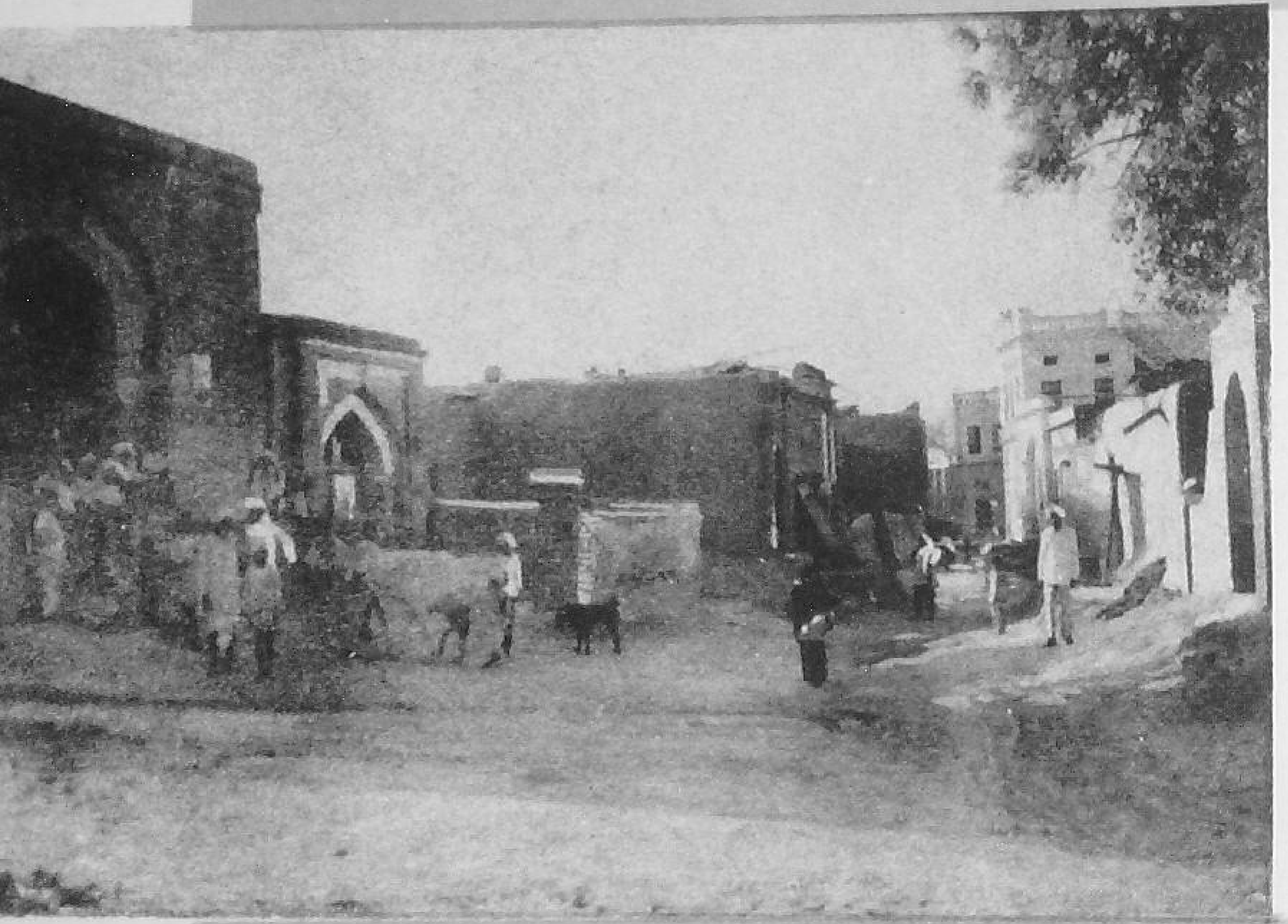
Finishing :—The internal plaster may be of cement, lime or mud with *Gobri leaping* and the external plaster may be of cement, lime or water proof mud plaster mixed with 5% Bitumen Emulsion.

Services :—Pit or bore hole latrine and pucca drain may be provided.

Costs :—The approximate costs of different buildings shown in this brochure are based on, more or less, *pucca* specifications, such as burnt brick in mud mortar for walls, permanent roof, good doors and windows etc., etc. The costs, however, would appreciably decrease, if poor specifications such as *pucca* pillars and *kutcha* panels are adopted. The figures of costs given in the pamphlet, when the labour is provided by the farmer, are based on the assumption that all the unskilled and semi-skilled labour would be provided by the farmer and his family and the materials like mud, thatch, jungle-wood etc., would be available free of cost, the farmer providing his own transport.

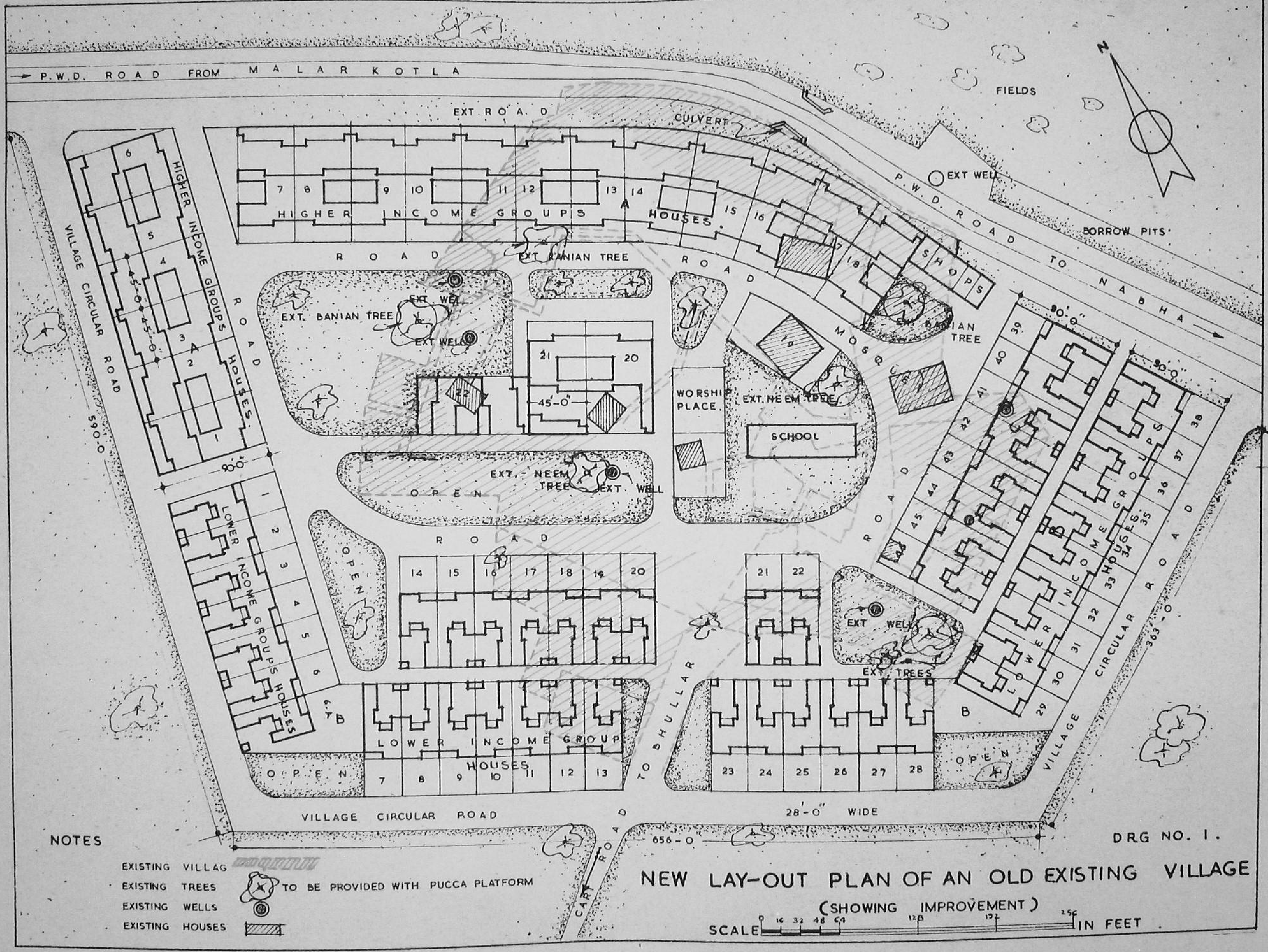


NEW LAYOUT PLAN FOR AN EXISTING VILLAGE



A typical entrance to a village. Note the lack of planning and encrpachment in narrow streets. For remedying these defects, conservative surgery may be necessary.

Plan No. I shows the layout of an existing village which has grown haphazardly but is susceptible to improvement. The hatched portion bounded by dotted lines indicates the existing boundaries of the village. All the *kutcha* and dilapidated houses within these limits are to be demolished, leaving behind the pucca structures such as houses, schools and places of worship including the shady trees and wells. The new layout has been so arranged as to incorporate in it all the existing permanent features. The existing village has been expanded to the limit of the village circular road as shown in the plan. Provision has been made in the new layout for connecting the roads and house plots, both for lower income groups as well as for higher income groups. Suitable designs for houses for both these income groups will be found in Plans Nos. 6, 7, 8, 9 and 10. Suitable provision has also been made for community requirements such as schools, worship places and open space for playgrounds. Details of proper sanitary platforms and drains around the existing wells will be found in Plans Nos. 21, 22, 25 and 26. Similarly, provision for masonry platforms around the existing large shady trees to serve as community centres will be found in Plan No. 24. The whole layout is indicative.



DRG NO. 1.

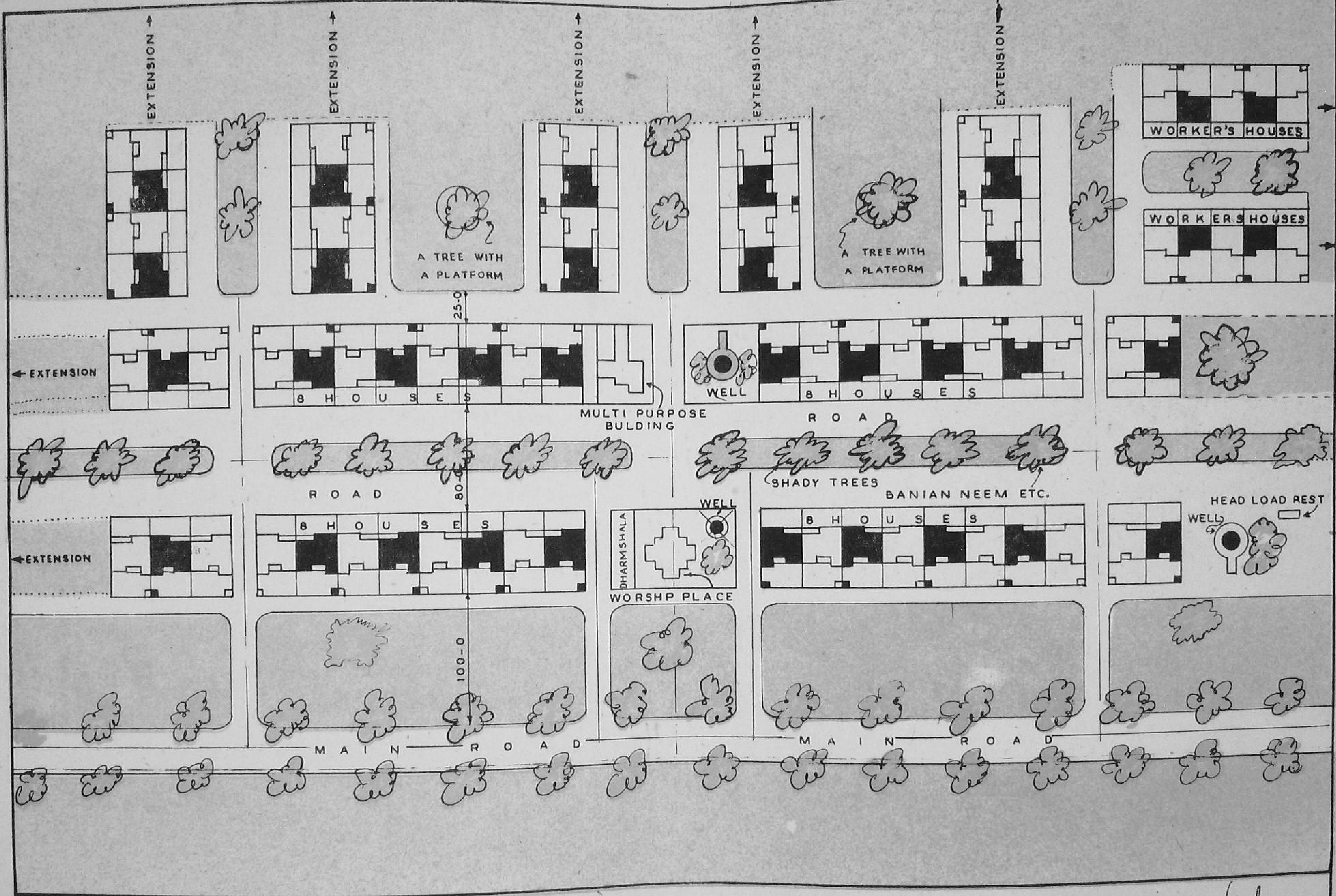
NEW LAY-OUT PLAN OF AN OLD EXISTING VILLAGE

(SHOWING IMPROVEMENT)

LAY OUT PLAN FOR A SMALL VILLAGE

Plan No. 2 shows a typical layout plan for a small village of 40 to 50 houses. The plan shows the arrangement and location of the houses and also the community buildings, such as a worship place, *dharamsala*, etc. Spacious open lawns have been provided and the houses have been arranged in rows of six to eight, in order to save on the cost of common walls and services such as sanitary, water-supply and electric installations. This pattern of row housing also gives a sense of community feeling. This layout plan also makes provision for future expansion.

This plan has been prepared to give a general idea of how a modern village could be laid out. This can, however, be modified to suit local conditions, topography, the needs of the inhabitants and availability of materials etc.



A TYPICAL LAY-OUT FOR A SMALL VILLAGE

(40 - 50 HOUSES)

DRG. NO. 2.

SCALE 0 16 32 48 64 IN FEET

ASST. ARCHITECT.

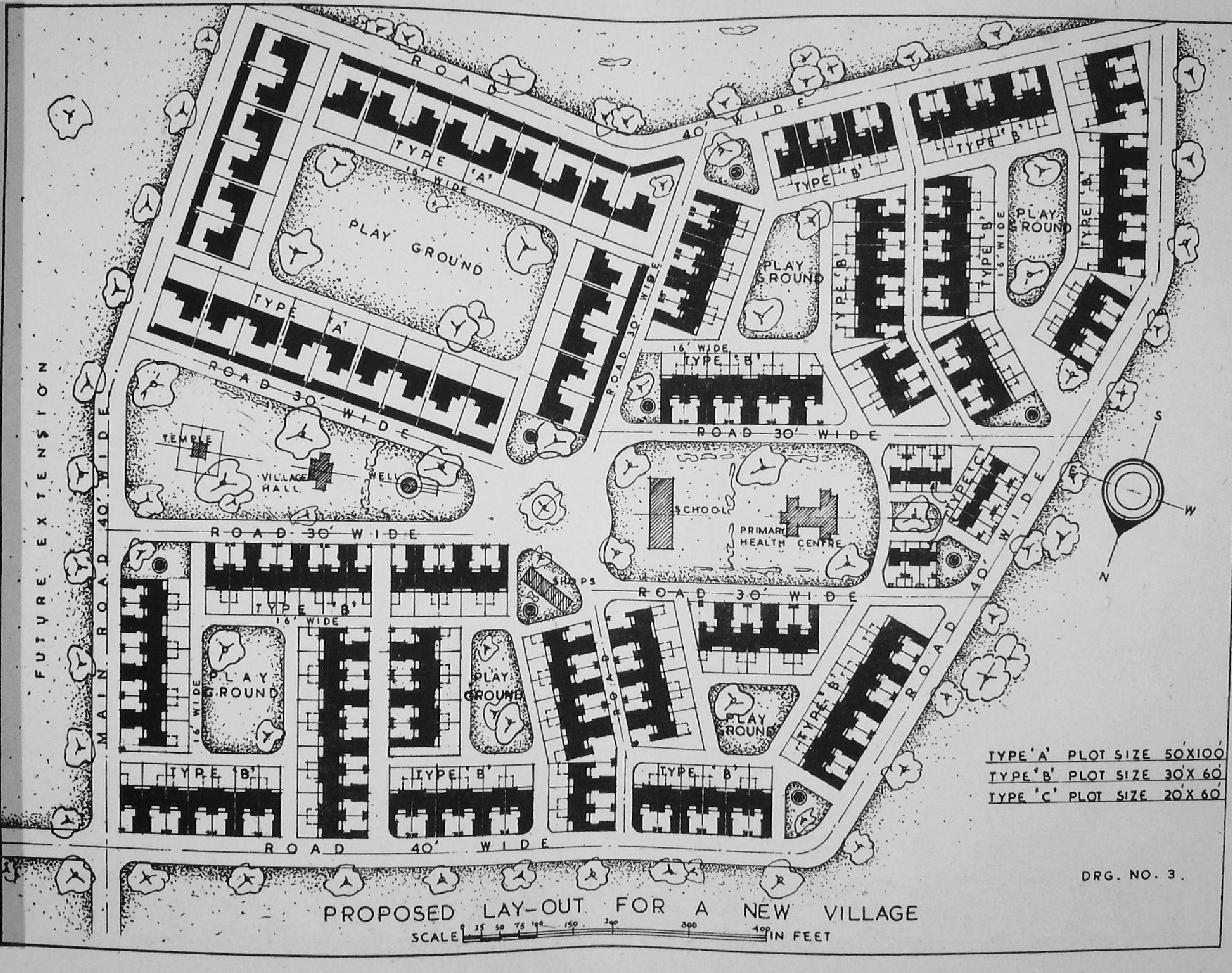
HOUSING ADVISER.

MINISTRY OF WORKS, HOUSING SUPPLY

GOVT. OF INDIA. NEWDELHI.

LAY OUT PLAN FOR A NEW LARGE VILLAGE

Plan No. 3 shows a typical layout plan for a new large village consisting of 176 houses. The special features of this plan are that the villagers of different income groups have been grouped together and common facilities such as schools, health centre, place of worship and village hall, shops, etc., have been provided at central places. Houses are to be built in rows of six to eight, in order to save on the cost of common walls and services such as water-supply, sanitary and electric installations. Provision has also been made for future expansion. A net-work of roads has been provided within the village and connecting the main roads.

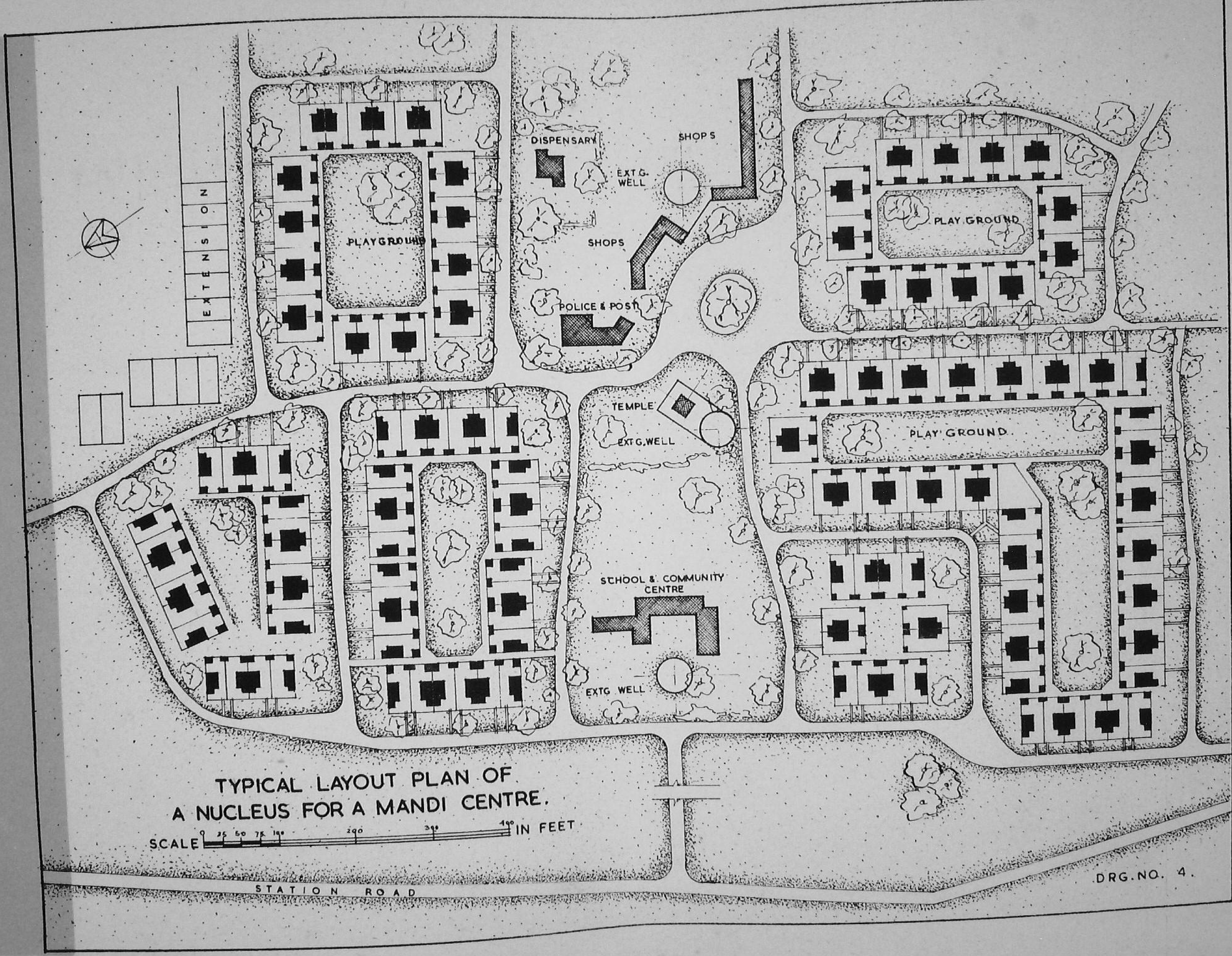


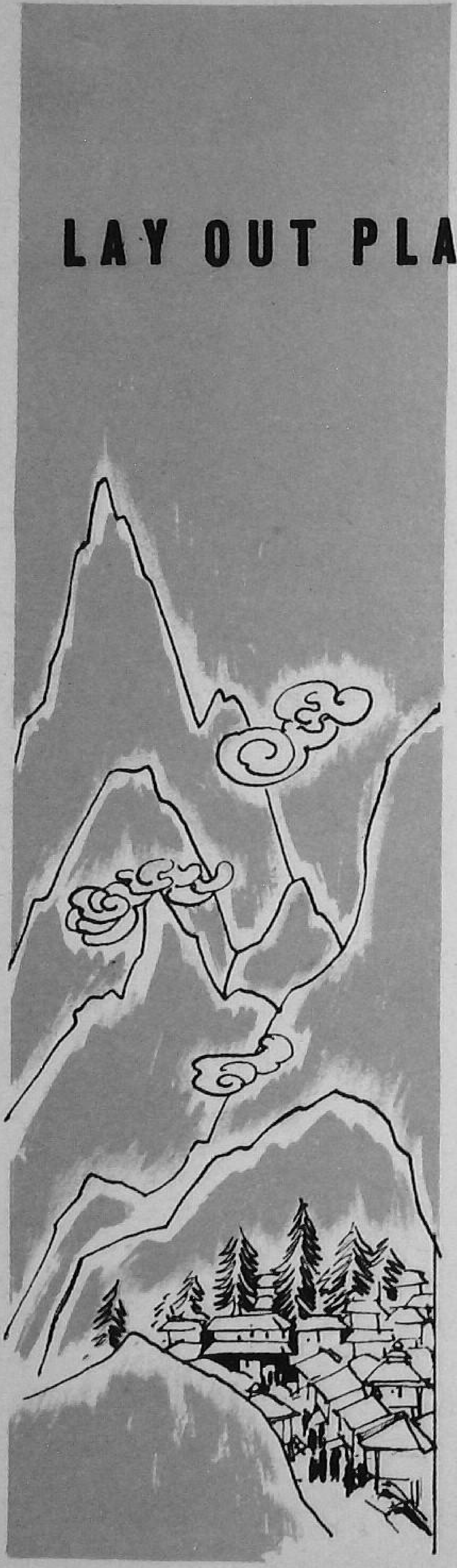
PROPOSED LAY-OUT FOR A NEW VILLAGE

LAY OUT PLAN FOR A NUCLEUS MANDI CENTRE (PLAINS)

Plan No. 4 shows the design of a typical layout of a Mandi centre in the plains. The commercial buildings and the community buildings such as schools, dispensaries, police-posts etc., are situated in the centre of the locality ; while residential accommodation has been provided around it in groups of buildings. In this layout, the residential buildings are semi-detached but row housing could also be resorted to if land is scarce.

This layout was worked out by the Chief Architect, C. P. W. D. for a village Datia, after taking into consideration requirements at site.

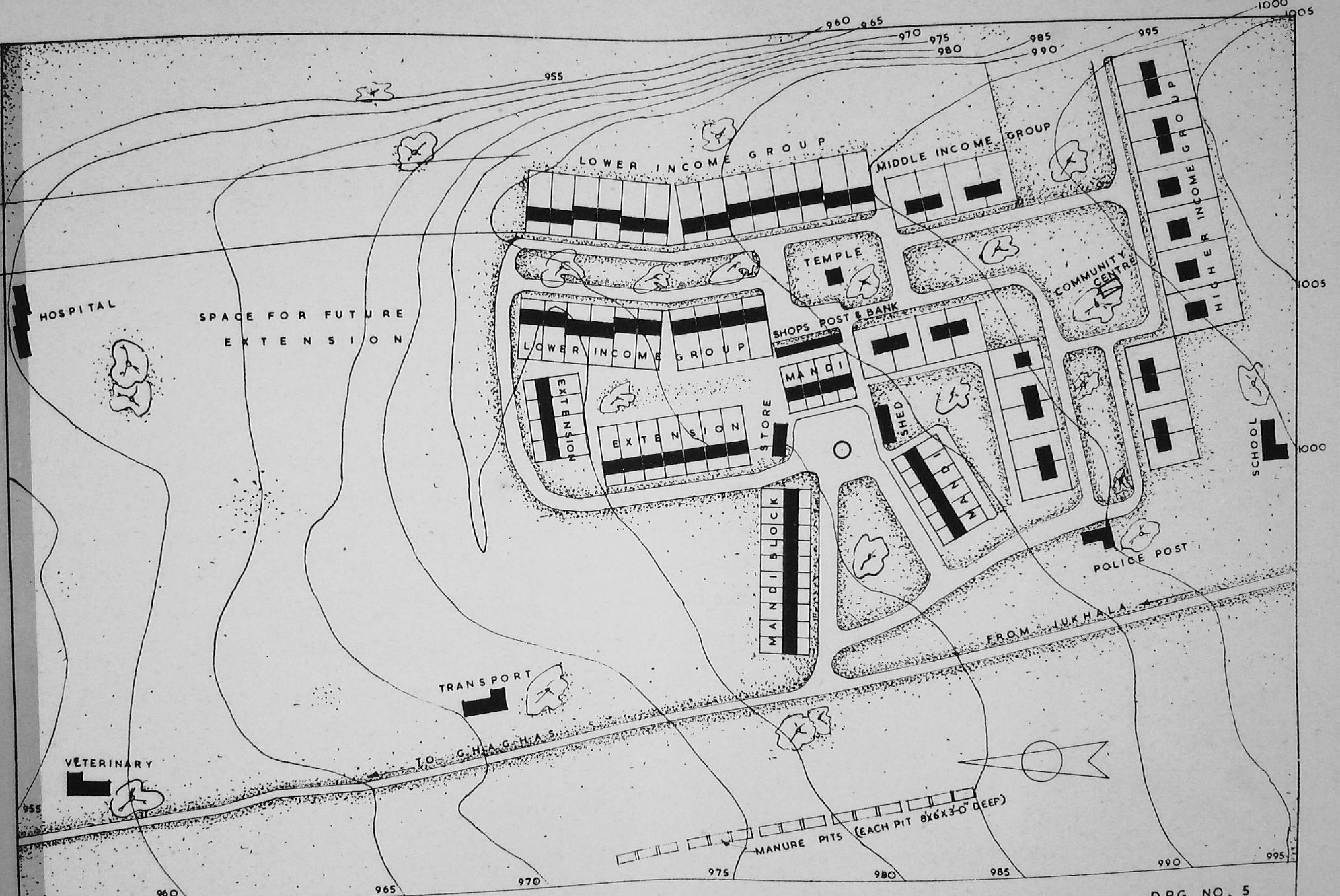

DISPENSARY
SHOPS
EXTG. WELL
SHOPS
POLICE & POST
PLAYGROUND
EXTENSION
PLAY GROUND
TEMPLE
EXTG. WELL
PLAY GROUND
SCHOOL & COMMUNITY CENTRE
EXTG WELL
TYPICAL LAYOUT PLAN OF
A NUCLEUS FOR A MANDI CENTRE.
SCALE 0 25 50 75 100 200 300 400 IN FEET
STATION ROAD
DRG. NO. 4.



LAY OUT PLAN FOR A NUCLEUS MANDI CENTRE (HILLY AREA)

Plan No. 5 shows a typical layout plan of a nucleus Mandi centre in a hilly region. The layout has been so arranged as to suit the topography of the area. Provision has been made in this layout for residential buildings for lower, middle and higher income groups and also for a community centre, shops, post-office, school, hospital, police-post, etc. The commercial buildings have been located in a separate area away from the residential colonies. Space has been provided for future expansion of the centre.

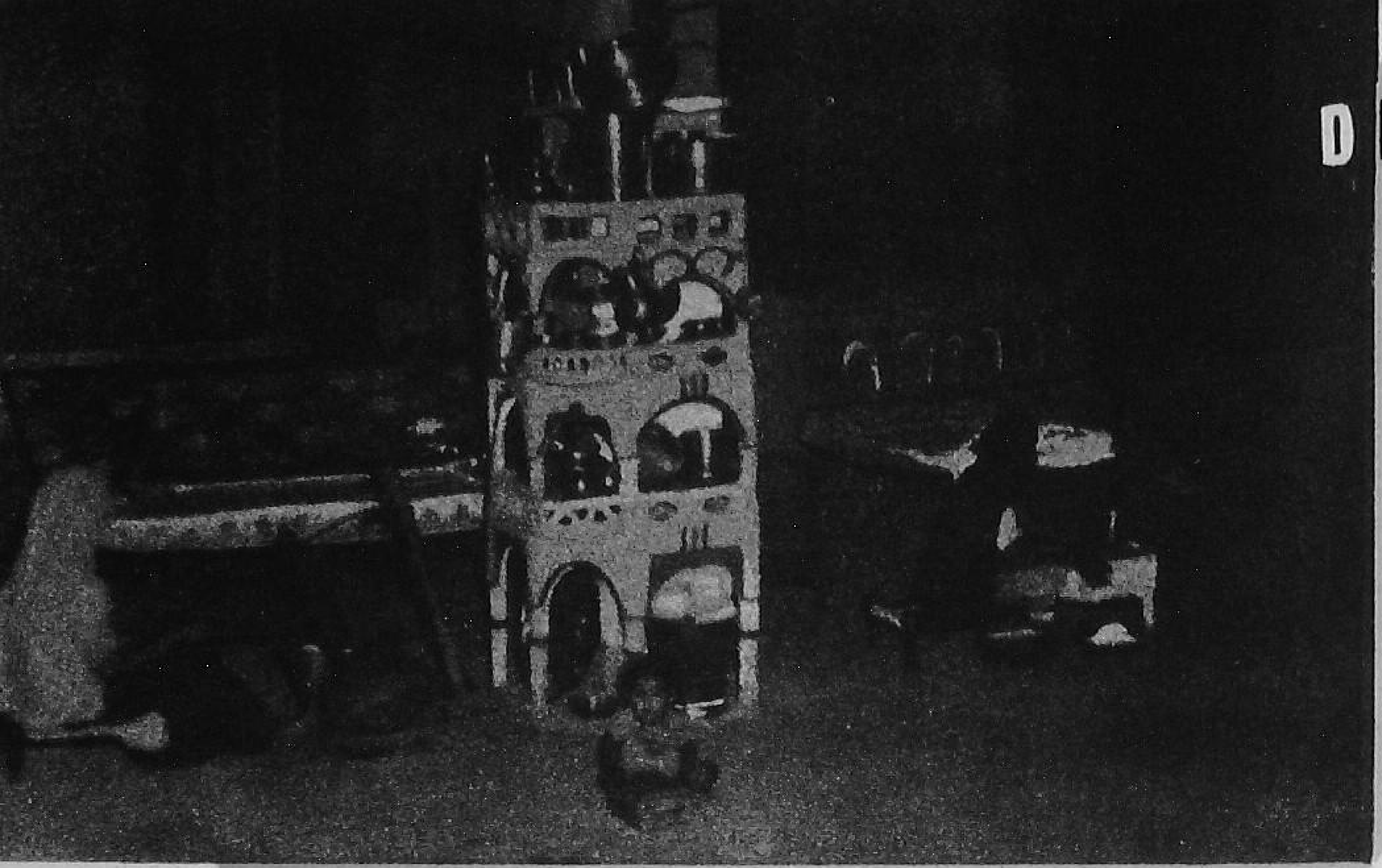
This layout was worked out by the Chief Architect, C.P.W.D. for a village in Bilaspur District.



TYPICAL LAY-OUT PLAN OF A NUCLEUS FOR A MANDI CENTRE.

(FOR HILLY AREA)

SCALE IN FEET



Interior decoration in a middle class Northern Indian house. It is necessary to provide nitches and shelves for storing utensils.

DESIGN FOR A SINGLE ROOMED HOUSE

DESIGN FOR A SINGLE-ROOMED HOUSE

Plan No. 6 shows a design for a single-roomed house in a plot of 20′×60′. This house would be suitable for persons of lower income groups. Such type of houses are to be constructed in rows of 6 to 8 in order to save on the cost of common walls and services.

The design provides for an open entrance platform of 6′-0″×6′-0″, a living room of 12′-6″×9′-9″, a smoke-less kitchen of 8′×6′ and a multi-purpose verandah of 12′-6″×8′, which can be converted into an additional room at little extra cost. The position of the cattle-shed and latrine which can be built to suit local conditions has been marked in the plan. The front courtyard is to be used as a meeting place for the men and the rear courtyard for the women.

The approximate requirement of materials and labour for the construction of one unit of this house is given below :—

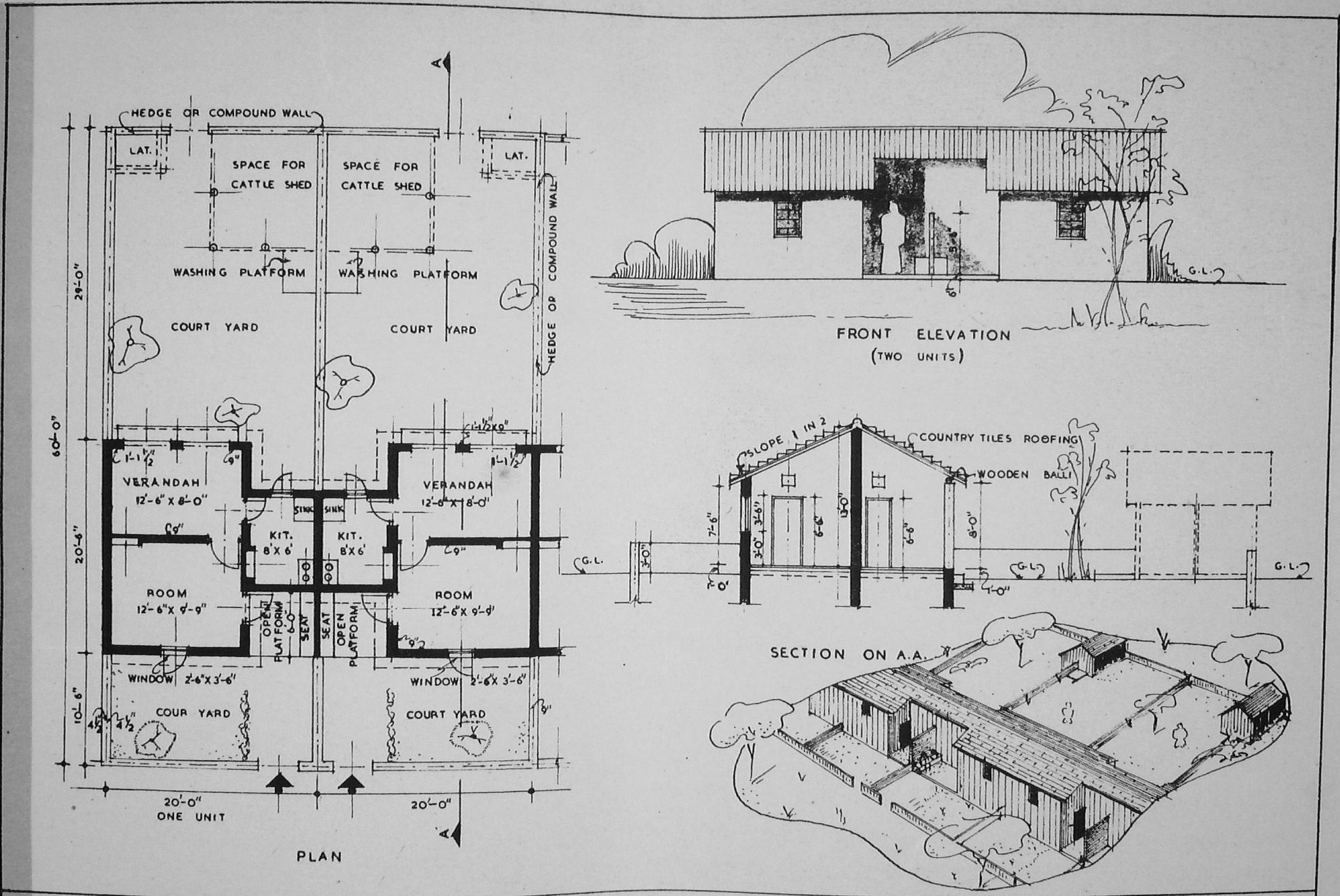
Materials :—

Cement	5 cwt.
Lime	45 cft.
Sand	150 cft.
Brick ballast 1½″ Gauge	80 cft.
Bricks	11,000 Nos.
Stone ballast ½″ Gauge	10 cft.
Sal ballies 4″ dia.	160 Rft.
Soft wood	12 cft.
Country tiles	2,700 Nos.
Bamboos	6 scores.
Precast cement concrete Jali	2 sft.
Solignum	2 gallons.

Labour :

Masons	3 Nos. for 15 days.
Beldars and coolies	6 Nos. for 15 days.
Bhisti	1 No. for 10 days.
Carpenters	2 Nos. for 7 days.
Tile layer	1 No. for 10 days.
Painter	1 No. for 3 days.

The cost of the house will vary from Rs. 1000/- to Rs. 1350/- at different places, for good specifications depending upon the local prices of materials and rates of labour. If labour is provided free by the villagers, the cost will vary from Rs. 500/- to Rs. 675/- for a semi-permanent structure.



DRG. NO. 6.

DESIGN FOR A SINGLE ROOM HOUSE

(PLOT SIZE 20'-0" X 60'-0")

SCALE 0 2 4 6 8 16 24 32 IN FEET.

DESIGN FOR A TWO ROOMED HOUSE (IN STAGES)

Plan No. 7 shows the design of a two-roomed house in a plot of 30′×90′. Such type of houses are to be built in rows of 6 to 8, in order to effect economy in the cost of common walls and services such as, watersupply, sanitary and electric installations. The design of the house is such that it can be constructed in two stages ; the first stage consisting of a living room, kitchen, store, verandah, bath and latrine including a store for cattle fodder and the cattle-shed. An additional room and a verandah can be added , in the second stage, in the front, as shown in the drawing, thus making the house suitable for a large family. The special feature of this house is that the women-folk get the privacy at the rear and the men can freely move about in the front portion. A number of shelves have been provided in the rooms as well as in the kitchen to provide sufficient storage space. This design is quite suitable for hot and dry regions and can be built to the pillar and panel type of construction ; the pillars being of pucca bricks and the panels of either mud walls or sun-dried bricks. The flat roof consists of brick tiles over-country-wood battens with 4″ thick mud-phuska for comfort during summer and winter. Small windows with iron-bars have been provided for cosiness and security. This design can be adopted in other regions also by effecting slight modifications in the size of windows and by converting the flat roof into a sloping one.

This was one of the designs of the rural houses in low-cost housing exhibition which found favour with villagers in Delhi area.

A spacious courtyard of 30′×30′ in the front can be used for sitting and sleeping purposes ; while a part of the courtyard at the back can be used for raising a vegetable garden with the waste water from the bath and the kitchen.

This house which is properly planned is suitable for Northern India. Mud walls are constructed with side planks, plaster is made water-proof by addition of 5% bitumen emulsion. The materials used are local.

The approximate requirements of materials and labour will be as follows :—

1st Stage

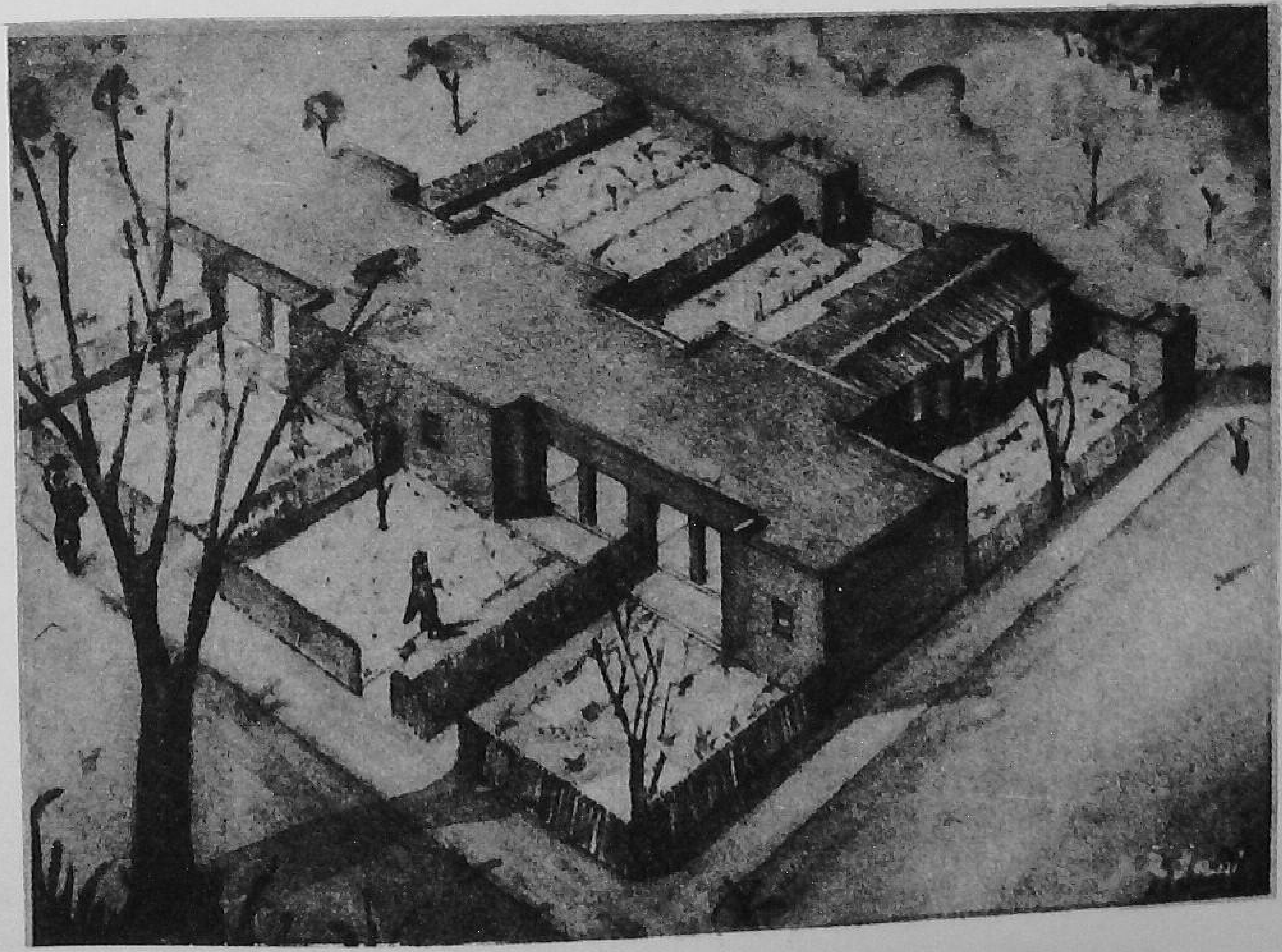
Materials :—		*Labour* :—
Cement	10 cwt.	Masons—3 Nos. for 30 days.
Lime	80 cft.	
Sand	200 cft.	Beldars and coolies—8 Nos. for 30 days.
Bricks 2nd class	5,000 Nos.	Bhisti—1 No. for 15 days.
Soft wood for doors and windows.	20 cft.	Carpenters —4 Nos. for 6 days.
M.S. bars—½″dia	20 Rft.	Thatcher—4 Nos. for 2 days.
		Painter —1 No. for 4 days.
Sal ballies	120 Rft.	
G.I. Sheets 24 B.W.G. 9′×3′	4 Nos.	
Tiles 12″×6″×2″	1,000 Nos.	
Wooden beams and karries	30 cft.	
Solignum	5 gallons	
Holding down bolts	8 Nos.	
Bitumen emulsion	30 gallons	
Shuttering for stabilised walls.		

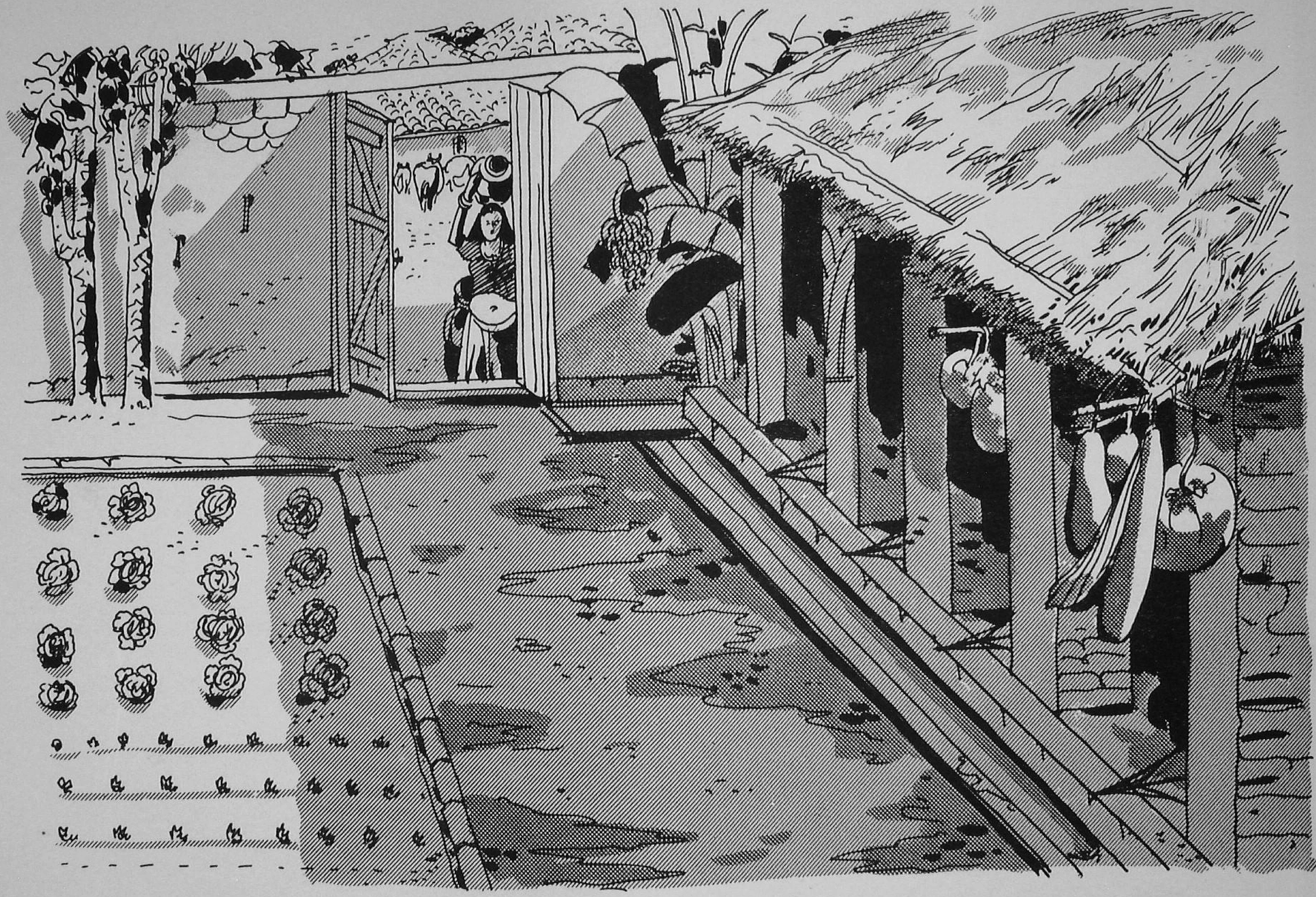
Note.—The farmer will bring the earth for the construction of walls in his own cart and grass from his farm for thatch roof free of cost.

2nd Stage

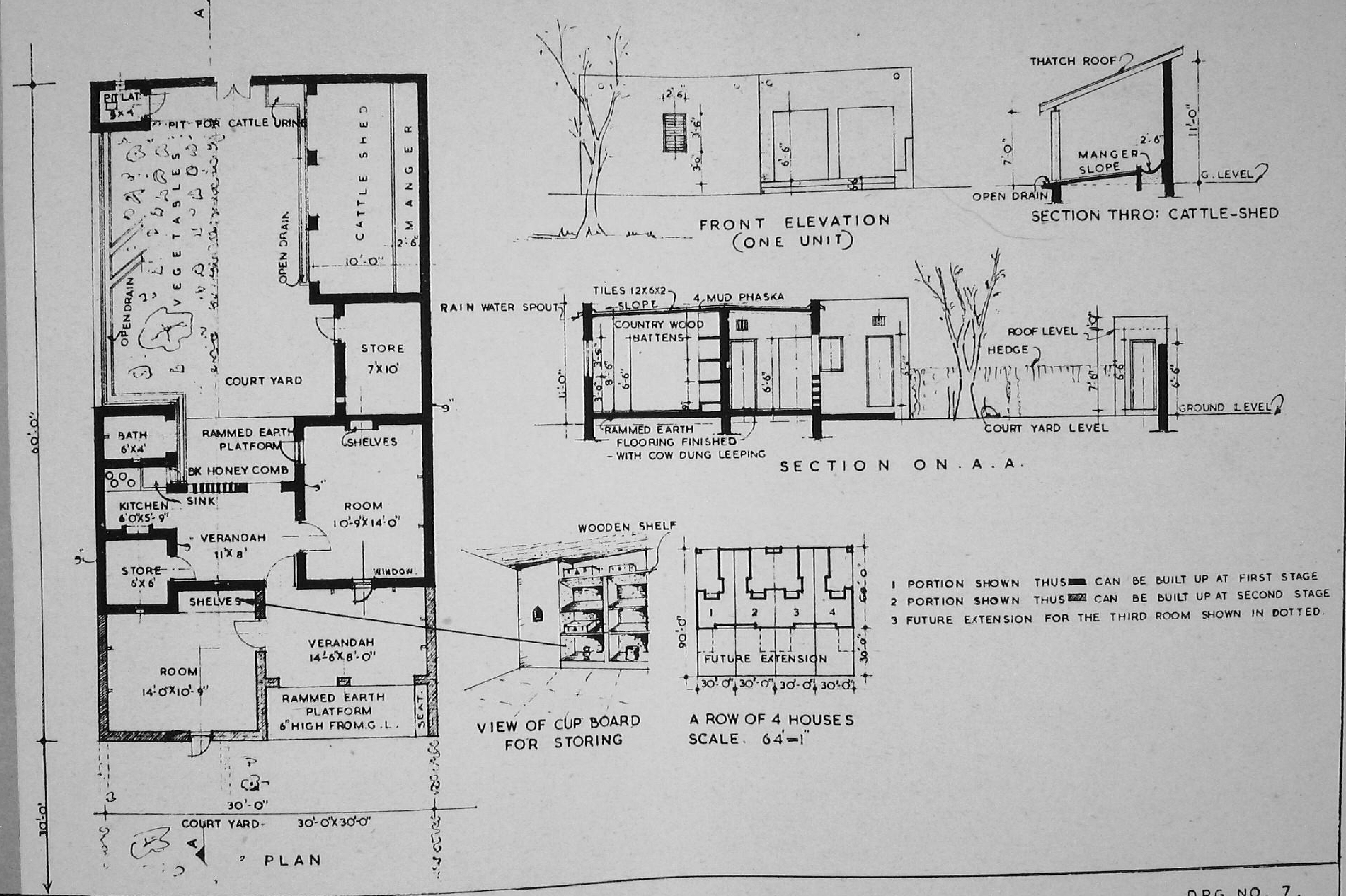
Materials :—		*Labour* :—
Cement	5 cwt.	Masons—2 Nos. for 15 days.
Lime	45 cft.	
Sand	100 cft.	Beldars & Coolies 4 Nos. for 15 days.
Bricks 2nd class	2,000 Nos.	Bhisti—1 No. for 5 days.
Timber for doors and windows.	5 cft.	Carpenters —4 Nos. for 2 days.
M.S. Bars—½″dia.	20 Rft.	Painter—1 No. for 1 day.
Tiles 12″×6″×2″	600 Nos.	
Wooden beams, kurries and shelves etc.	25 cft.	
Solignum	2 gallons	
Bitumen emulsion	10 gallons	

The cost of the house will vary from Rs. 2,600/- to Rs. 3,400/- at different places depending upon the cost of materials and labour in a particular locality. If labour is provided free by the villagers, the cost will vary from Rs. 1,300/- to Rs. 1,700/- for a semi-permanent structure.





A back courtyard of a small rural house. A small area can be used for growing vegetables at the leisure utilising waste water.



DRG. NO. 7.

TWO ROOMED HOUSE WITH A CATTLE SHED FOR A RURAL AREA
(BY STAGES)

SCALE 0 2 4 6 8 16 24 32 IN FEET

DESIGN FOR A THREE ROOMED HOUSE

Plan No. 8 shows a typical design for a three-roomed semi-detached house on a plot of 50′×100′. The house consists of three main rooms, a kitchen, store, bath, large front and rear verandahs with a paved courtyard. Separate provision has been made for a large cattle shed, store for fodder, and a pit-latrine. The front courtyard of 30′×40′ can serve as a multi-purpose space for men and children. The inner courtyard affords enough privacy for women and can be used for several purposes. A spacious rear verandah can be used for dining, working and sleeping purposes. The carts and cattle can pass through the 7′ wide passage into the rear courtyard. The house can be constructed with local materials by adopting the pillar and panel construction. The sloping roof can be of either country tiles, Manglore tiles or A. C. sheets according to the availability of materials. The roof of the cattle shed may be either of tiles or of thatch in order to reduce cost. The approximate requirement of materials and labour to build a house of this size is given below :—

Materials :—

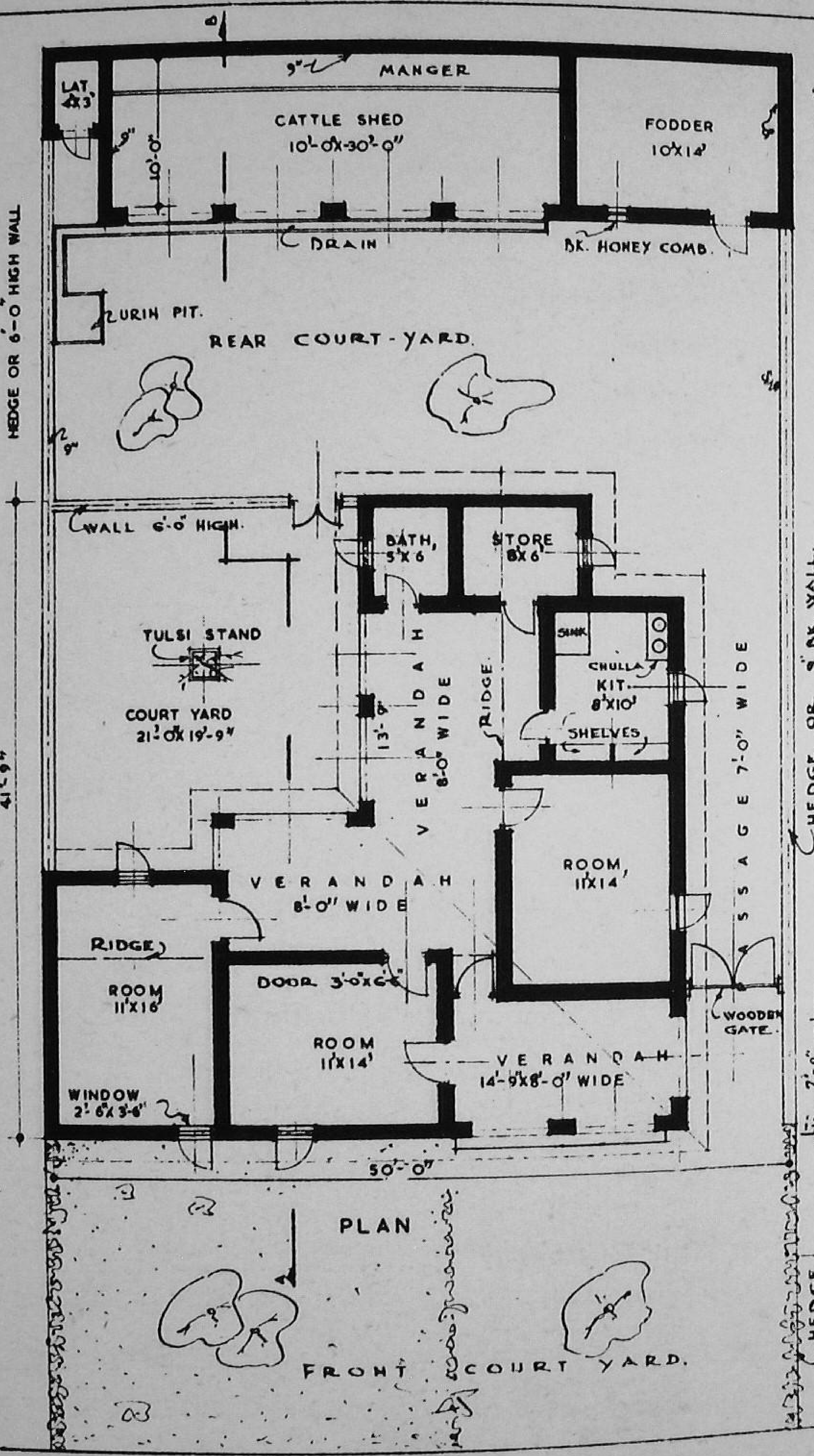
Cement	1·5 tons.
Lime	240 cft.
Sand	800 cft.
Brick ballast $1\frac{1}{2}$″ gauge	650 cft.
Bricks	57,000 Nos.
Stone ballast $\frac{1}{2}$″gauge	60 cft.
Sal-ballies 4″ dia.	220 Rft.
Soft-wood	132 cft.
A. C. Sheets	1,900 sft.
A. C. Ridging and valleys	30 pairs.
Solignum	5 gallons.
Hold-fasts	64 Nos.
Bamboos	16 scores.
Munj ban	1 Md.

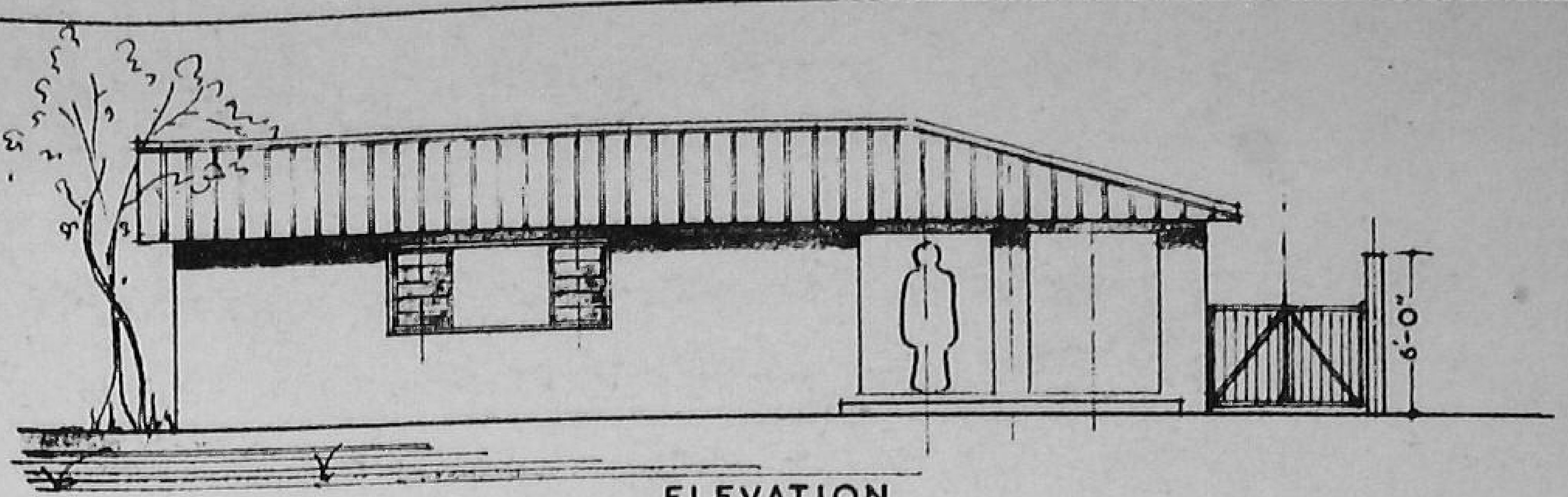
Labour :—

Masons	15 Nos. for 15 days.
Beldars and coolies	30 Nos. for 15 days.
Bhisties	3 Nos. for 15 days.
Carpenters	5 Nos. for 15 days.
Thatchers	2 Nos. for 10 days.
Painters	2 Nos. for 3 days.
Mistry	1 No. for 6 days.

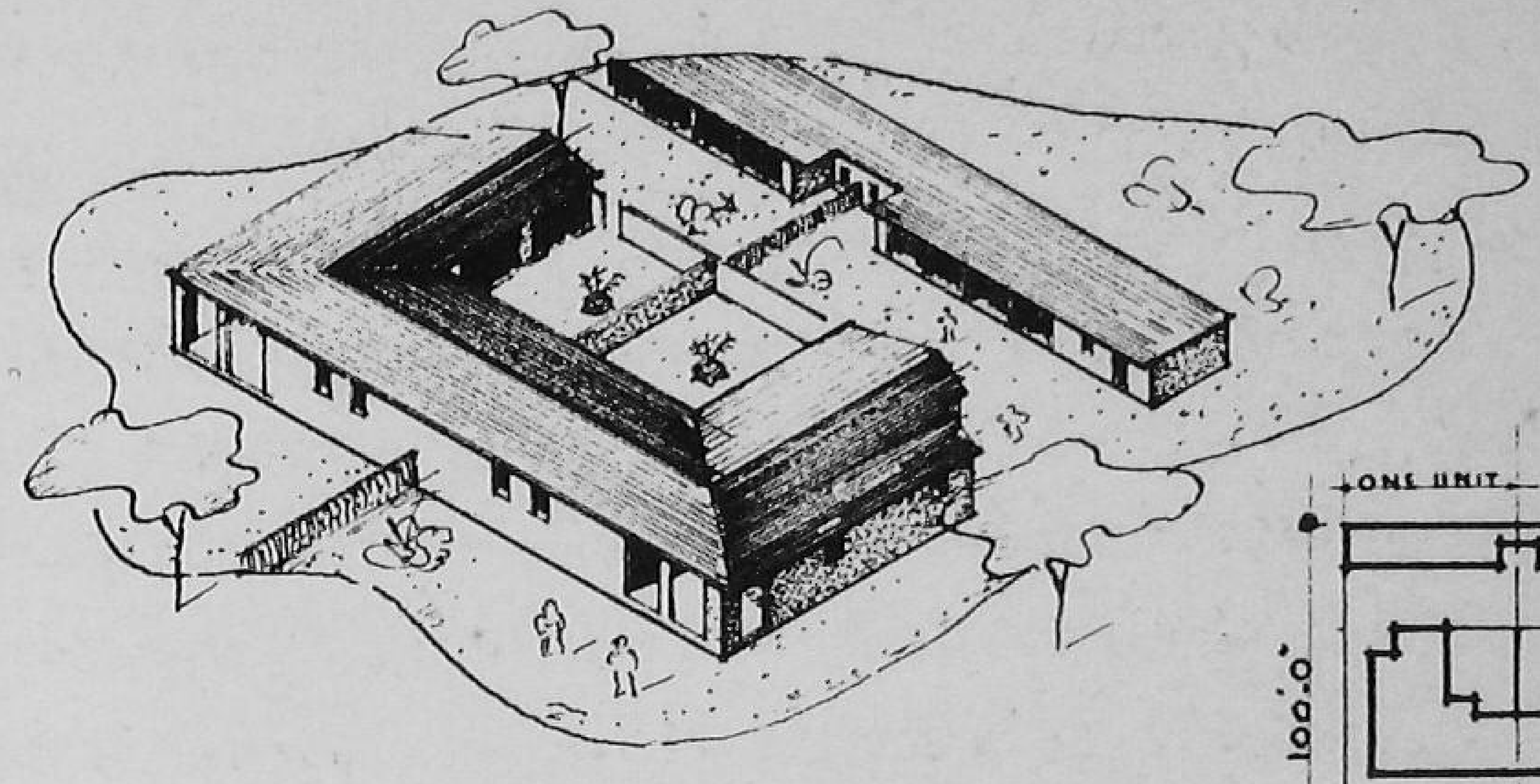
The cost of the house will vary from Rs. 6,300/- to Rs. 8,400/- at different places for good specifications depending upon the local cost of materials and labour. If the labour is provided free by the villagers, the cost will vary from Rs. 3,150/- to Rs. 4,200/- for a semi-permanent structure.

A good cattle-shed with a sloping hard floor and drains to carry carry away dirty water.

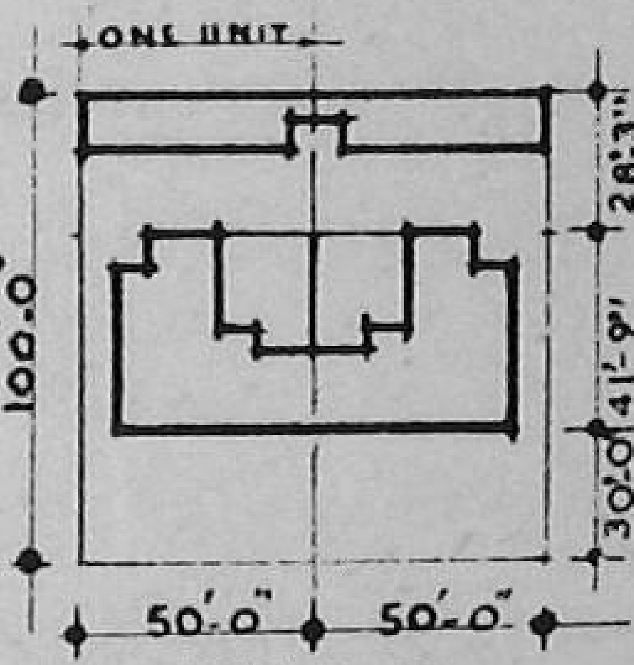




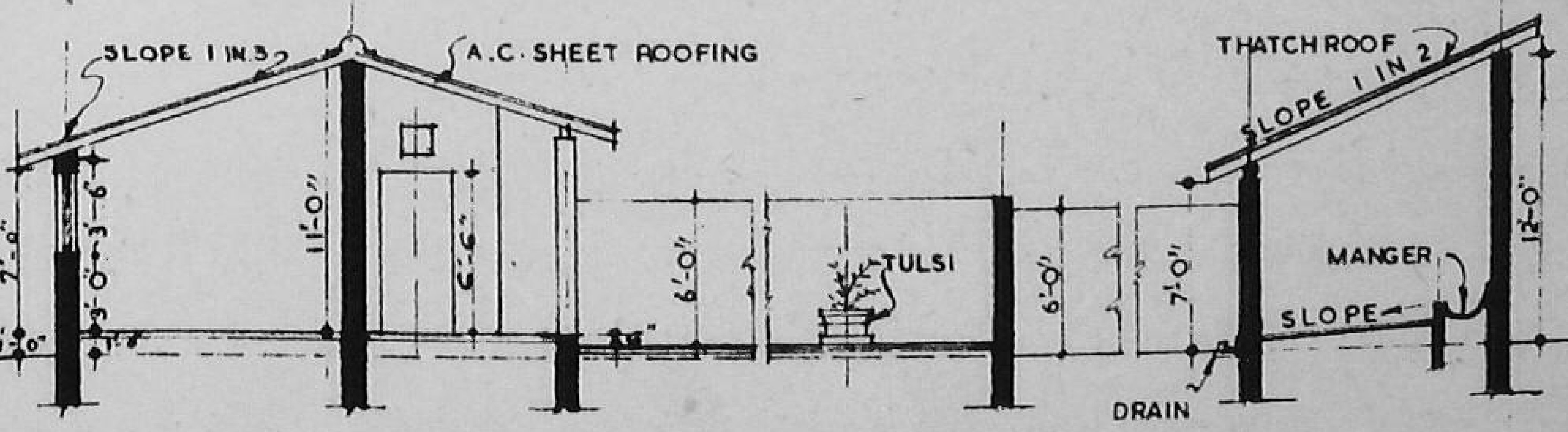
ELEVATION
(ONE UNIT)



ISOMETRIC – VIEW



KEY PLAN



SECTION ON. A.B.

A THREE-ROOMED HOUSE (WITH A CATTLE-SHED)

DRG. NO. 8.

SCALE 0 2 4 6 8 16 24 32 IN FEET

DESIGN FOR A FIVE ROOMED HOUSE

Plan No. 8A shows a typical design for a large five-roomed semi-detached house on a plot of 60′ × 120′ suitable for farmers with big holdings. The house consists of five main rooms, store, kitchen, dining verandah, bath, front and rear verandah with a paved court-yard. Separate provision has been made for a large cattle shed, store for fodder, pit latrine and bath. The front court-yard of 25′ × 60′ can serve as a multi-purpose space for men and children. The inner court-yard affords enough privacy for women. The spacious rear verandah can be used for dining, working and sleeping. The carts and cattle can pass through the 9′-3″ wide passage into the rear court-yard. The house can be constructed with local materials by adopting the pillar and panel construction or complete walls in brick with mud mortar. The sloping roof can be of either country tiles, Manglore tiles or A.C. sheets according to the availability of materials. The roof can also be made flat if required. The roof of the cattle shed may be either of tiles or of thatch in order to save on cost. The approximate requirement of materials and labour to build a house of this size is given below :—

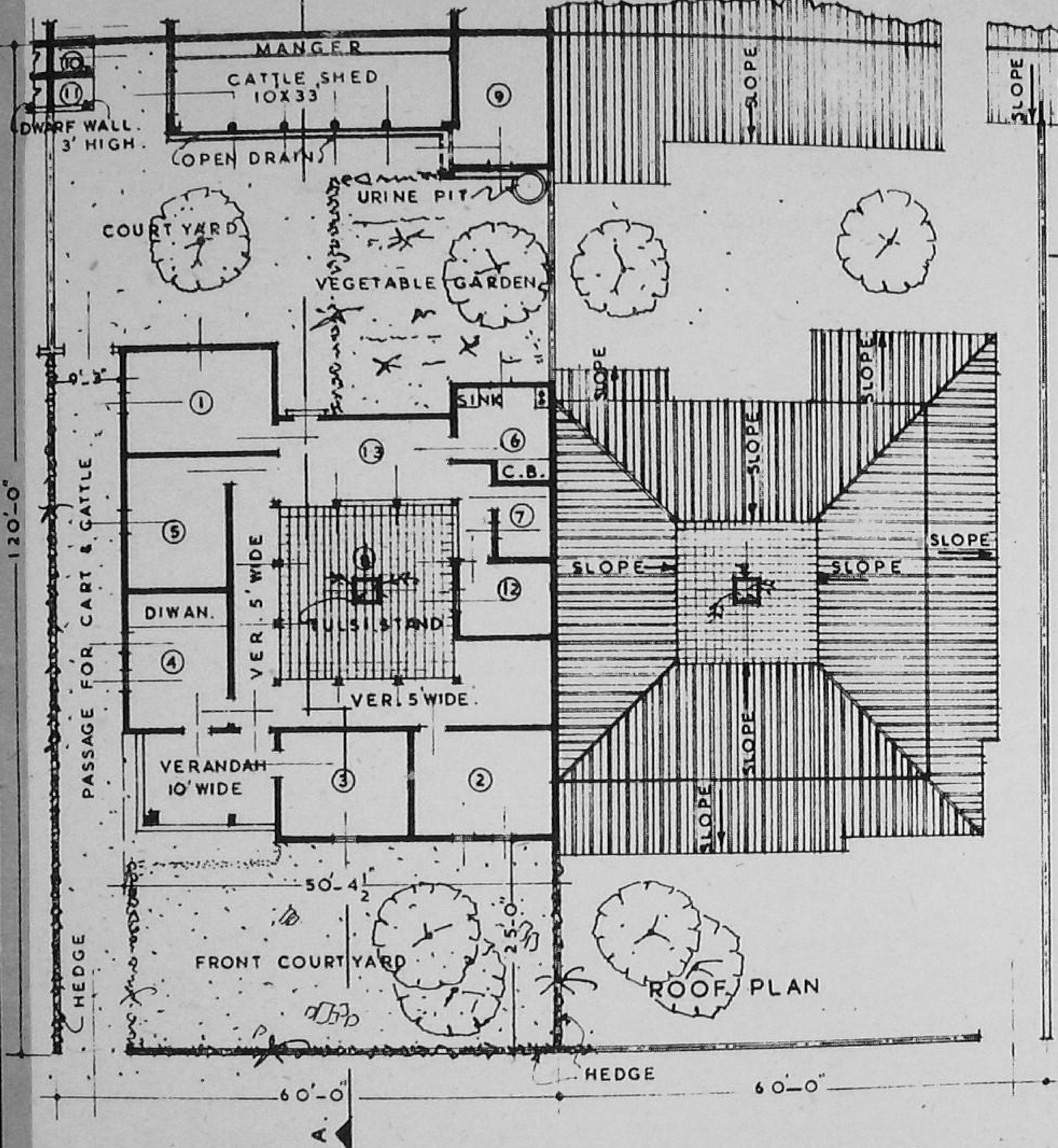
Materials :—

Cement	2·4 tons.
Lime	360 cft.
Sand	1,200 cft.
Brick ballast 1½″ gauge	1,000 cft.
Bricks	86,000 Nos.
Stone ballast ½″ gauge	100 cft.
Sal ballies 4″ dia.	260 Rft.
Soft wood	200 cft.
A. C. sheets	3650 sft.
A. C. Ridging & valleys	70 pairs.
Solignum	8 gallons.
Hold fasts	120 Nos.
Bamboos	20 scores.
Munj ban	1 md.

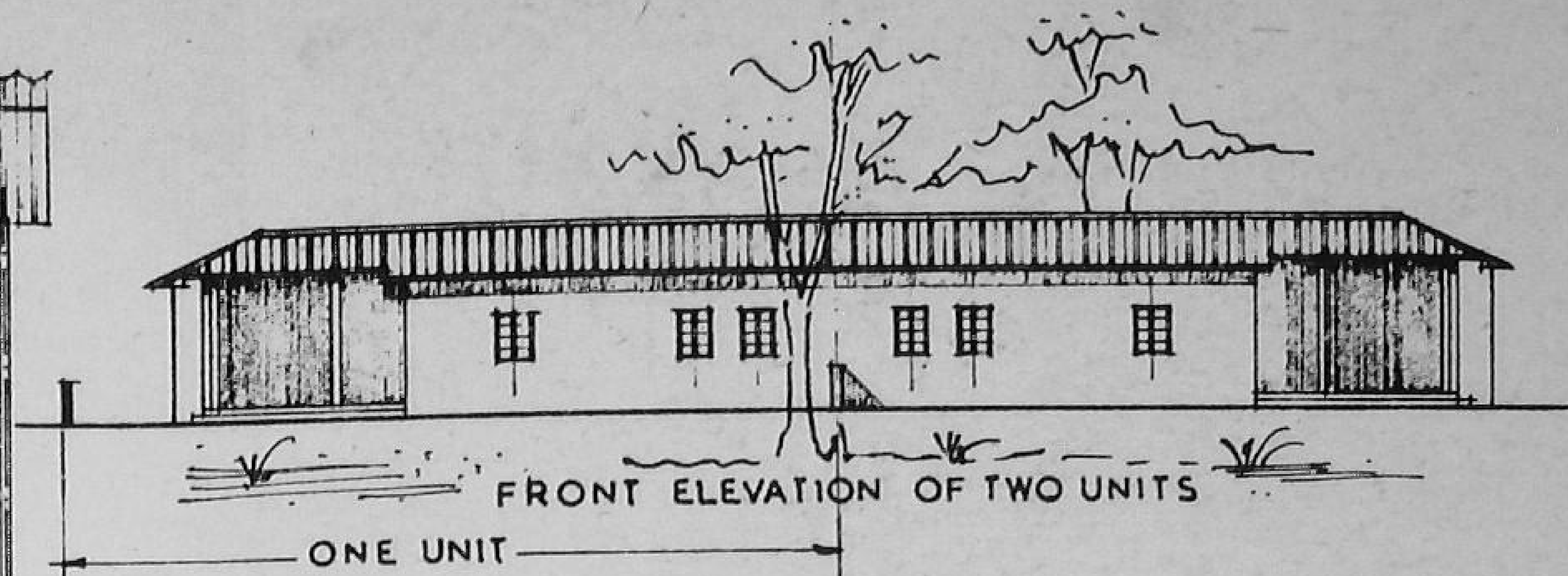
Labour :—

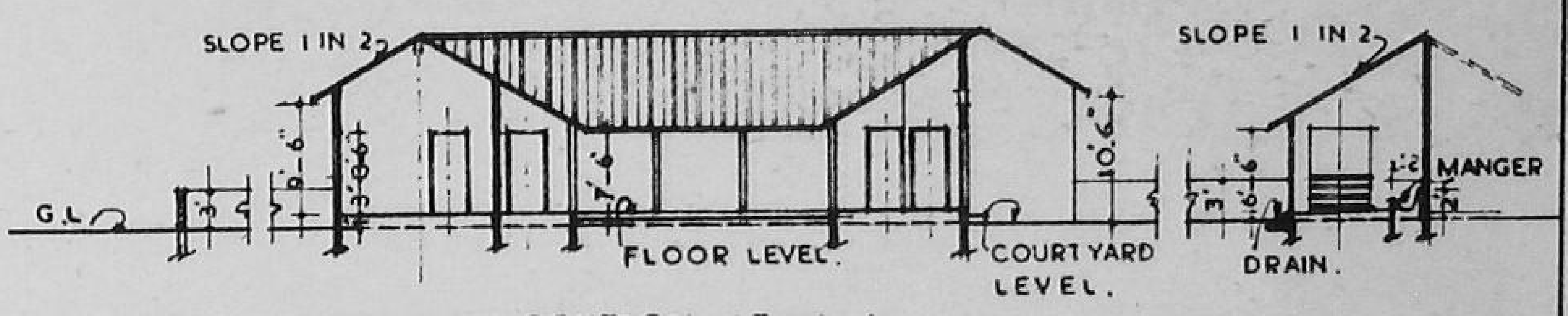
Masons	12 Nos. for 30 days.
Beldars and coolies	23 Nos. for 30 days.
Bhisties	2 Nos. for 30 days.
Carpenters	4 Nos. for 30 days.
Thatchers	3 Nos. for 10 days.
Painters	3 Nos. for 3 days.
Mistry	2 Nos. for 5 days.

The cost of the house will vary from Rs. 9,600/- to Rs. 12,800/- at different places for good specifications depending upon the local cost of materials and labour. If the labour is provided free by the villagers, the cost will vary from Rs. 4,800/- to Rs. 6,400/- for a semi-permanent structure.

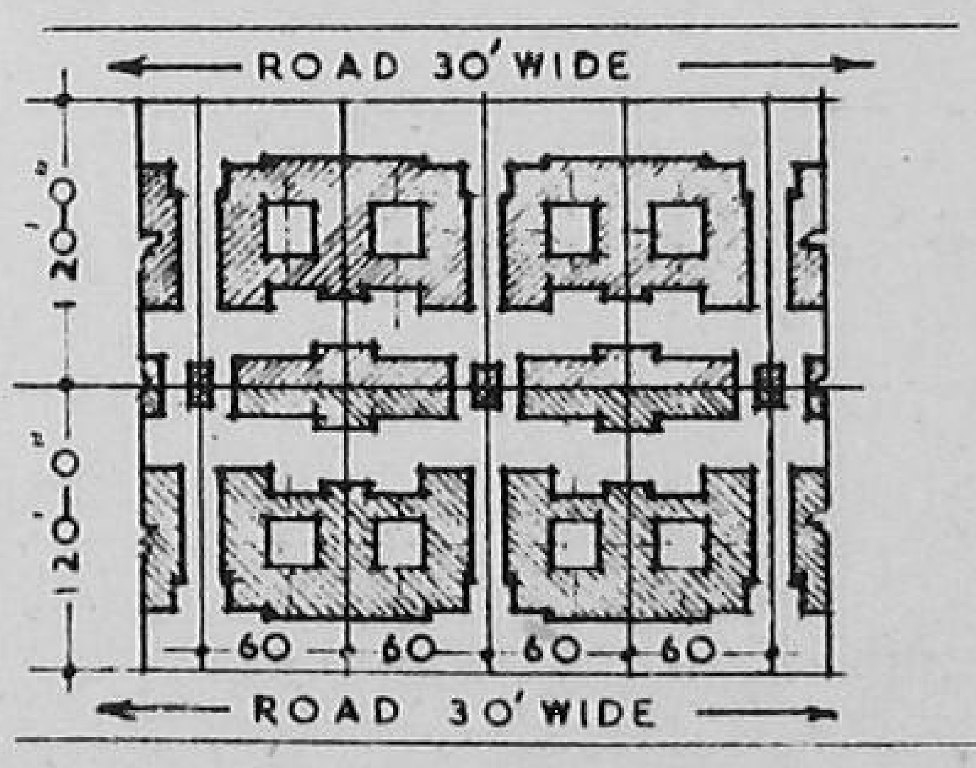


PLAN.





SECTION AT A.A.



KEY PLAN. (8 HOUSES)
SCALE. 128' = 1"

REFERENCES:—

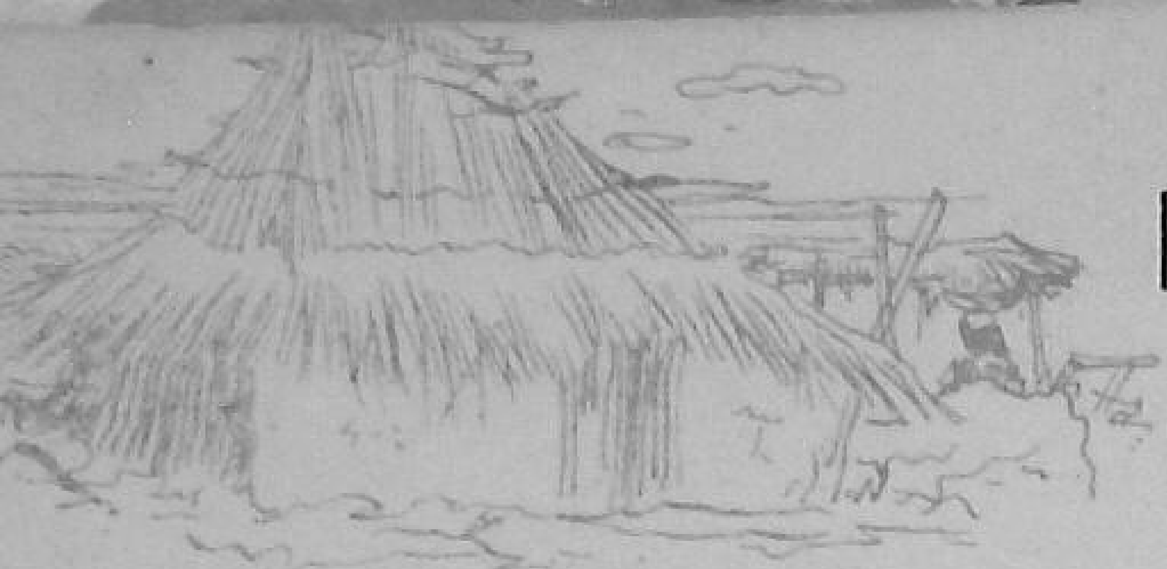
1	ROOM	12'X17'
2	ROOM	12'X16'
3	GUEST ROOM	12'X14'
4	DIWAN KHANA	12'X16'
5	ROOM	12'X13'
6	KITCHEN	10'X 8'
7	BATH	8'X 5'
8	PAVED COURT YARD	20'X20'
9	FODDER STORE	10'X15'
10	LATRINE	3'X 4'
11	BATHING PLATFORM	3'X 4'
12	STORE	10'X 8'
13	DINNING VERANDAH & LADIES SITTING	20'X 9'

DESIGN FOR A HOUSE (SEMI DETACHED) FOR,
HIGHER INCOME GROUP IN A RURAL AREA.
PLOT SIZE 60'X120'

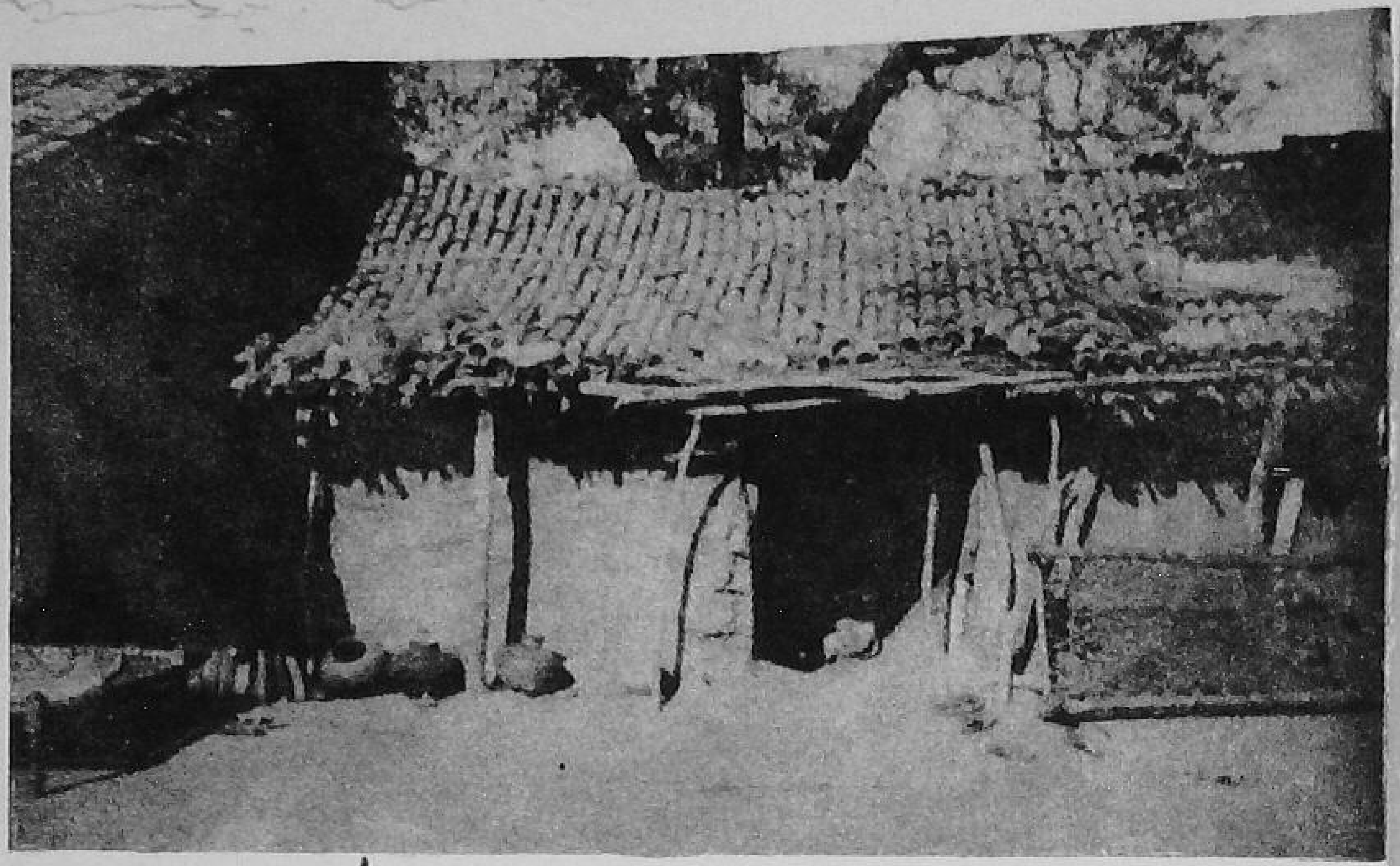
SCALE 0 4 8 12 16 24 32 40 48 IN FEET.

DRG. NO. 8 A.

6-APR 1955



HOW TO IMPROVE AN EXISTING HOUSE



A typical hut for a poor class family. Note the rickety roof; absence of plinth, proper doors and windows and other requirements which go to make a livable house.

Many village houses lack proper light, ventilation and sanitation. Such houses are generally dark, damp and ill-ventilated. The roofs are made of non-durable materials without proper slope. The floor level is sometimes below the adjoining ground level. The waste water of kitchen is allowed to accumulate, thus providing fertile ground for breeding mosquitoes. Domestic animals like, cows, buffaloes and bullocks are kept in the verandah or the front court-yard. Plan No. 9 shows the sketch of a house which has the above defects. Alongside is the sketch of the same house after carrying out improvements. A statement of the improvements carried out with minor changes is given below :—

(i) Light and ventilation have been improved by providing proper windows.

(ii) Dampness is eliminated by raising the existing floor level by 9″ to 1′ above the adjoining ground level. Accumulation of waste water and insanitary conditions are eliminated by providing pucca flooring for kitchen and bathing place and by leading away waste water to a vegetable garden or to a soak pit.

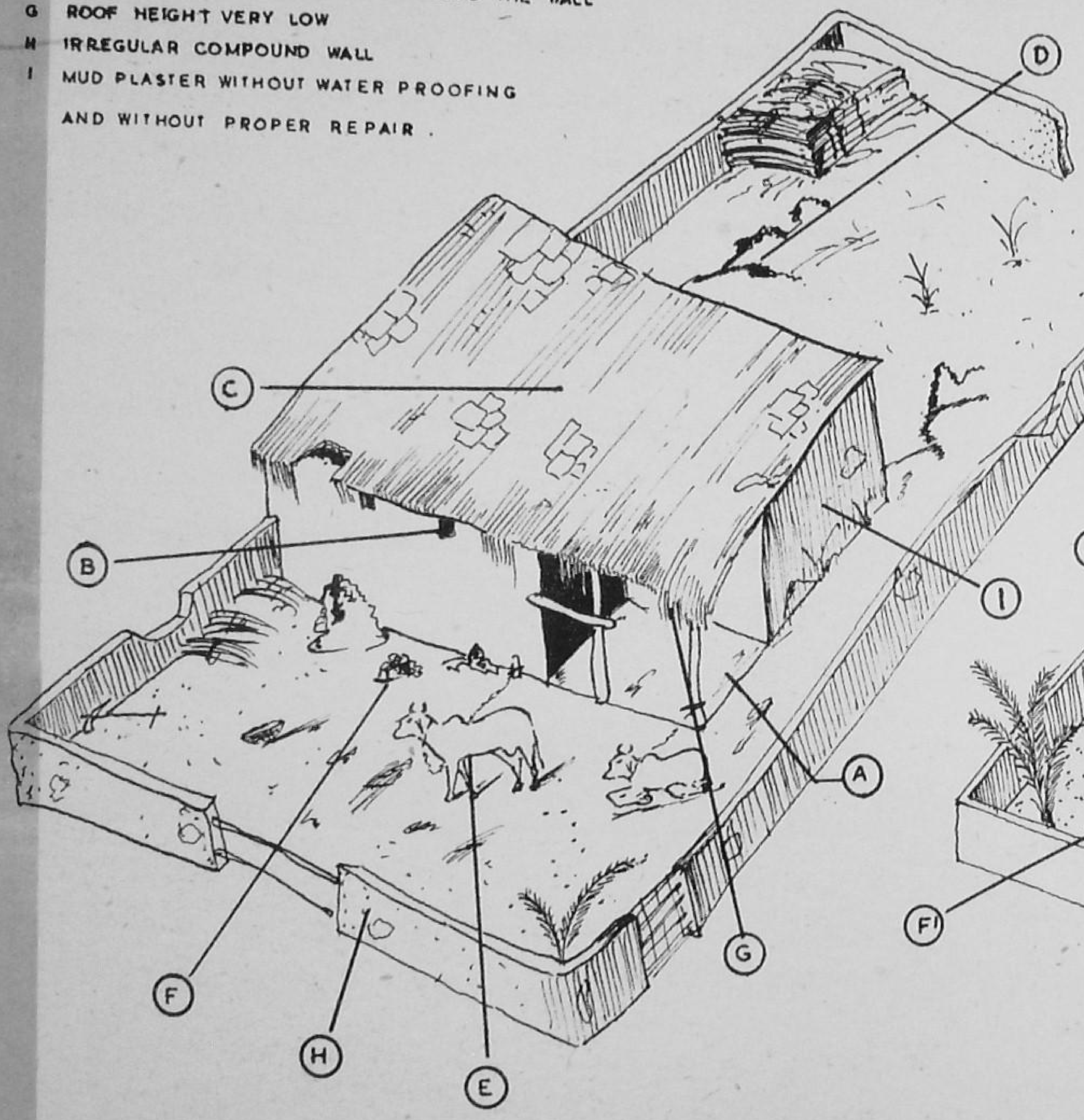
(iii) To prevent dampness and rain water getting in, the roof is replaced by a proper permanent material like A.C. sheets, country tiles etc., to a proper slope.

(iv) Mosquito breeding is eliminated by providing proper cattle shed in the rear court-yard.

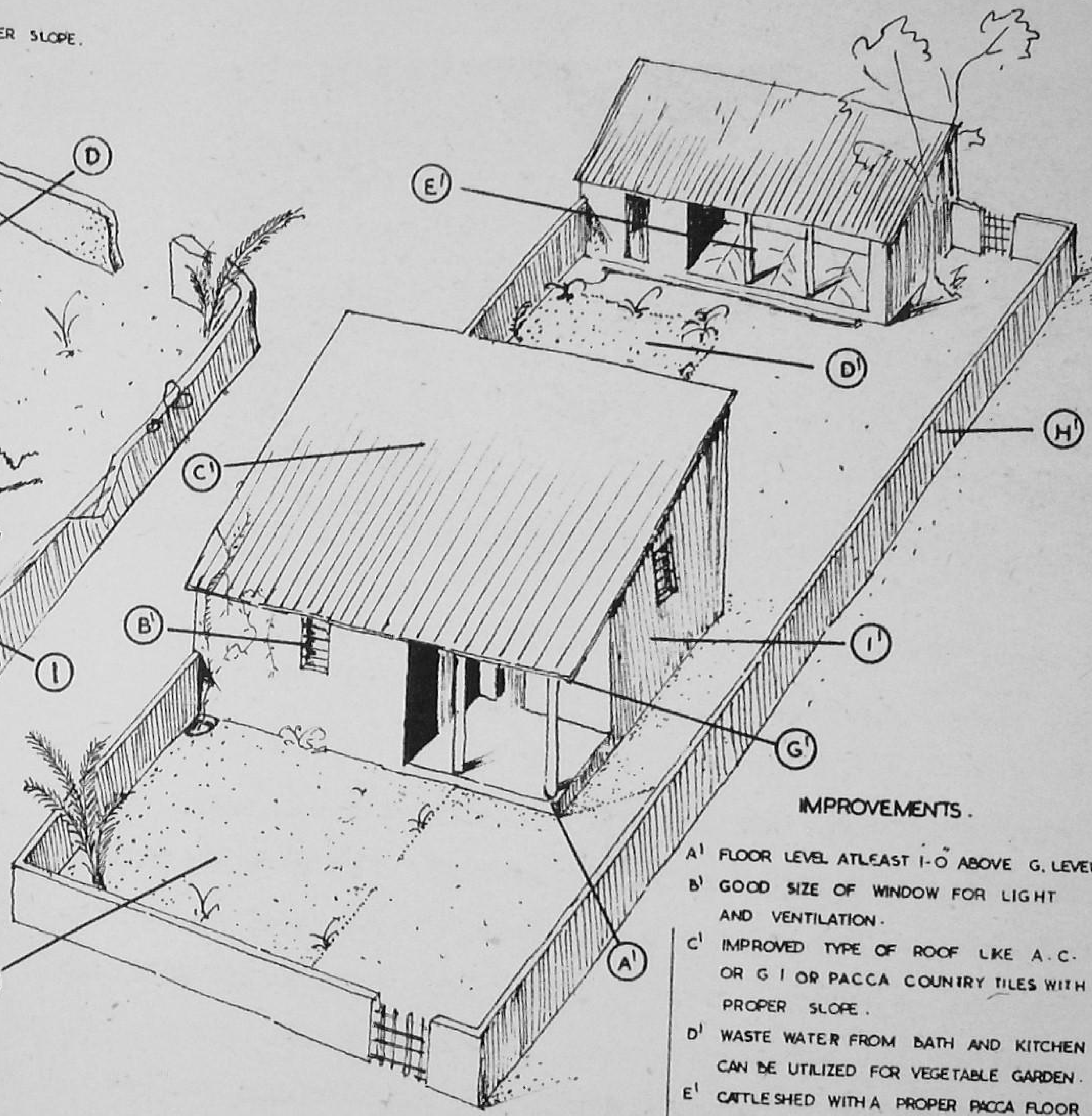
Newly constructed house for workers in the project areas. A good verandah, proper windows and ventilators ensure light and ventilation. The material used are all local.

AS EXISTS TO-DAY.

A FLOOR LEVEL BELOW GROUND LEVEL.
B TOO SMALL WINDOWS.
C ROOF OF NON-LASTING MATERIALS LIKE, THATCH, KACHA COUNTRY TILES, ETC, WITHOUT PROPER SLOPE.
D THE GROUND IS CONTAMINATED BY KITCHEN & BATH WATER.
E DOMESTIC ANIMALS ANY WHERE
F ALL RUBBISH ETC COLLECTED ARROUND THE WALL
G ROOF HEIGHT VERY LOW
H IRREGULAR COMPOUND WALL
I MUD PLASTER WITHOUT WATER PROOFING AND WITHOUT PROPER REPAIR.



BEFORE



AFTER

IMPROVEMENTS.

A' FLOOR LEVEL ATLEAST 1-0" ABOVE G. LEVEL.
B' GOOD SIZE OF WINDOW FOR LIGHT AND VENTILATION.
C' IMPROVED TYPE OF ROOF LIKE A.C. OR G I OR PACCA COUNTRY TILES WITH PROPER SLOPE.
D' WASTE WATER FROM BATH AND KITCHEN CAN BE UTILIZED FOR VEGETABLE GARDEN.
E' CATTLE SHED WITH A PROPER PACCA FLOOR & A MANGER FOR DOMESTIC ANIMALS
F' FRONT COURTYARD FOR SEATING AND SLEEPING PURPOSES.
G' SUFFICIENT HEIGHT AT THE END, ATLEAST 6.6"
H' PROPER COMPOUND WALL WITH WOODEN GATE.
I' WATER PROOF PLASTER.

A TYPICAL VILLAGE HOUSE

BEFORE AND AFTER IMPROVEMENTS

DRG. NO. 9.

DESIGN FOR A PRIMARY SCHOOL

Plan No. 10 shows a design of a primary school which can be built in three stages. The first stage consists of two class rooms, a teachers' room and a 7'-0" wide verandah. The second stage, one more class room is added and the verandah extended. In the third stage, an additional class room and a store room is added ; thus completing a primary school of 4 class rooms, a spacious verandah and a store and a teachers' room. Provision has been made in each room for a black-board and a cup-board for keeping books and papers. Each class room has adequate ventilation and light. Either a sloping roof with A.C. sheets, country or Manglore tiles or a flat roof may be provided depending upon the local climatic conditions and the availability of materials. The approximate requirements of materials and labour for this building is given below :—

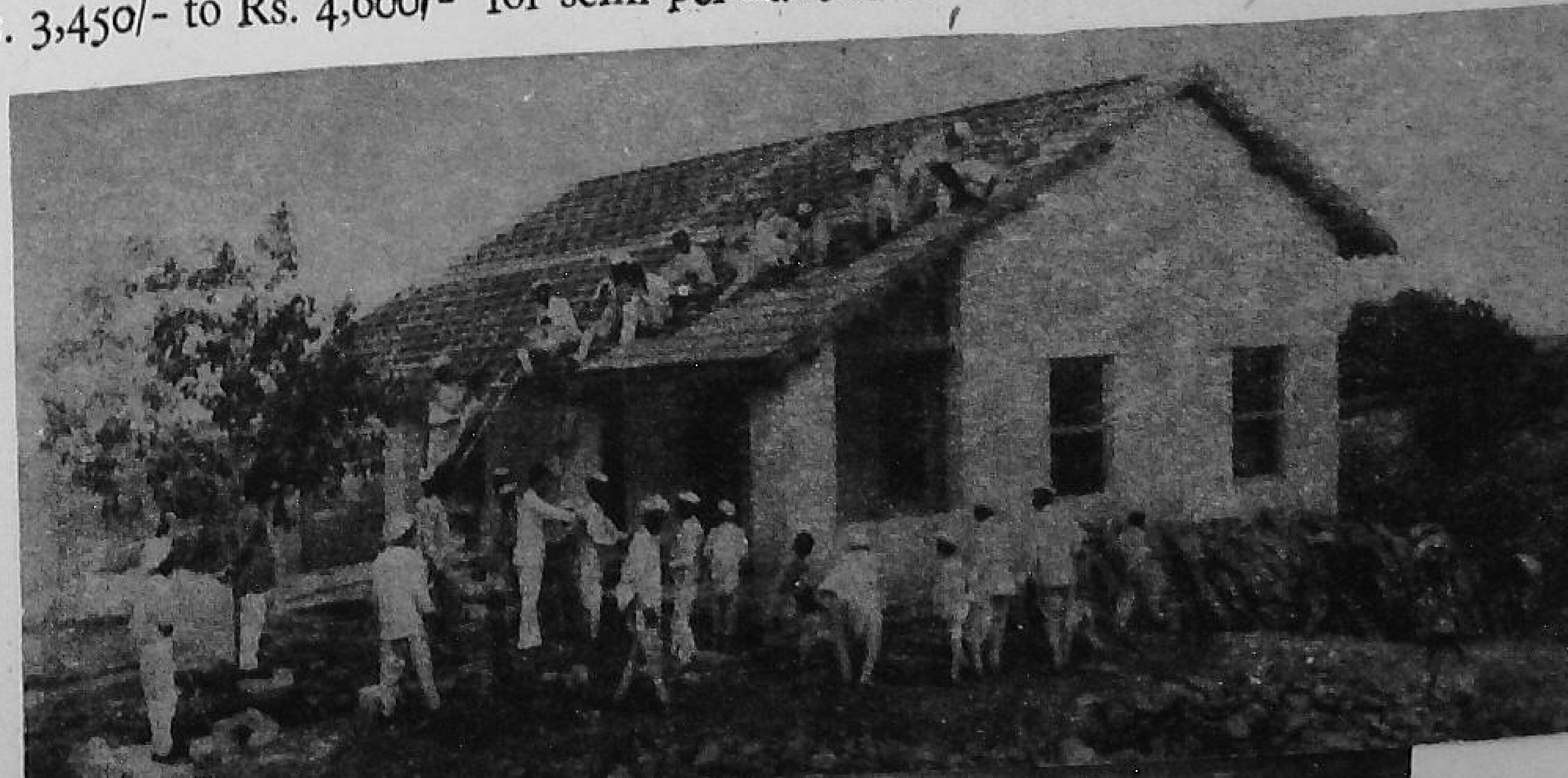
Materials :—

Cement	0·6 tons.
Lime	190 cft.
Sand	600 cft.
Brick ballast 1½"gauge	350 cft.
Bricks	65000 Nos.
Stone ballast ½"gauge	30 cft.
A. C. sheets	3050 sft.
A. C. Ridging	29 pairs.
Hold-fasts	80 Nos.
Sal-wood	26 cft.
Soft-wood	152 cft.
Solignum	10 gallons.

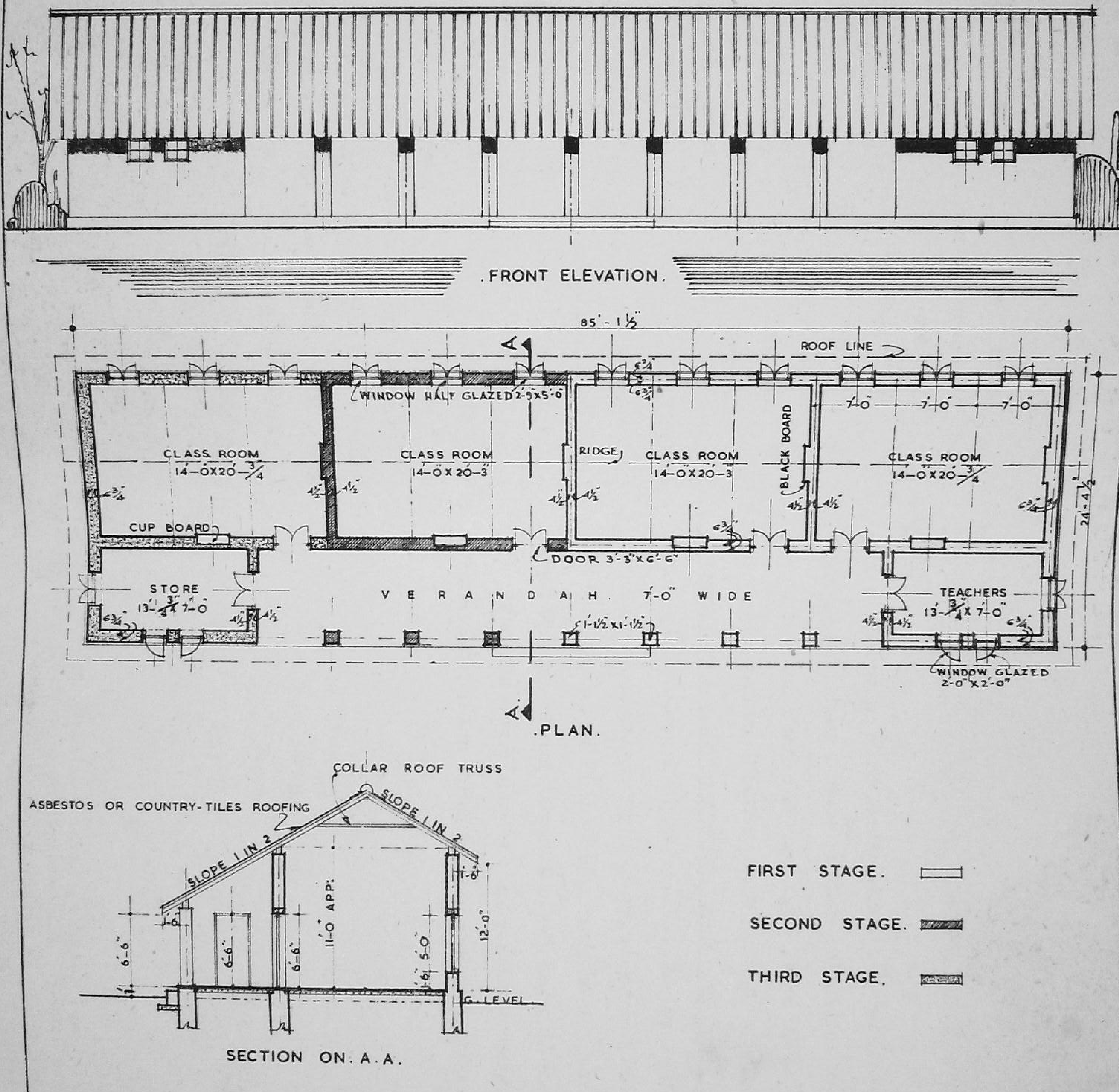
Labour :—

Masons	8 Nos. for 30 days.
Beldars and coolies	15 Nos. for 30 days.
Bhisties	3 Nos. for 15 days.
Carpenters	6 Nos. for 15 days.
Painter	1 No. for 8 days.
Mistry	1 No. for 8 days.

The cost of building will vary from Rs. 6,900/- to Rs. 9,200/- at different places for good specifications depending upon the local cost of materials and labour. If the labour is provided free by the villagers, the cost will vary from Rs. 3,450/- to Rs. 4,600/- for semi-permanent structure.



A school building being completed by the villagers' own labour. The materials used are locally available. The design is simple which can be adopted in any village.



DESIGN FOR A PRIMARY SCHOOL. FOR A RURAL AREA.

DRG. NO. 10.

SCALE 0 2 4 6 8 16 24 32 IN FEET.

DESIGN FOR A SECONDARY SCHOOL

Plan No. 11 shows a design for a Secondary school which has been designed to meet the requirements of a few neighbouring villages. The building provides for 7 class rooms, craft-room, common hall, staff room, office, store and a large verandah in the rear of the building. Future extension , if required, is also shown in the plan. The open field in the rear of the building can be used for a playground. A sloping roof with A.C. sheet, Manglore or country tiles or a flat roof may be provided to suit the local climatic conditions and availability of materials. The cost of the building will vary from Rs. 19,500/- to Rs. 26,000/- at different places, for good specifications depending upon the local cost of materials and labour. If the labour is provided free by the villagers, the cost will vary from Rs. 9,750/- to Rs. 13,000/- for a semi permanent structure. The approximate requirement of materials and labour for this building is given below :—

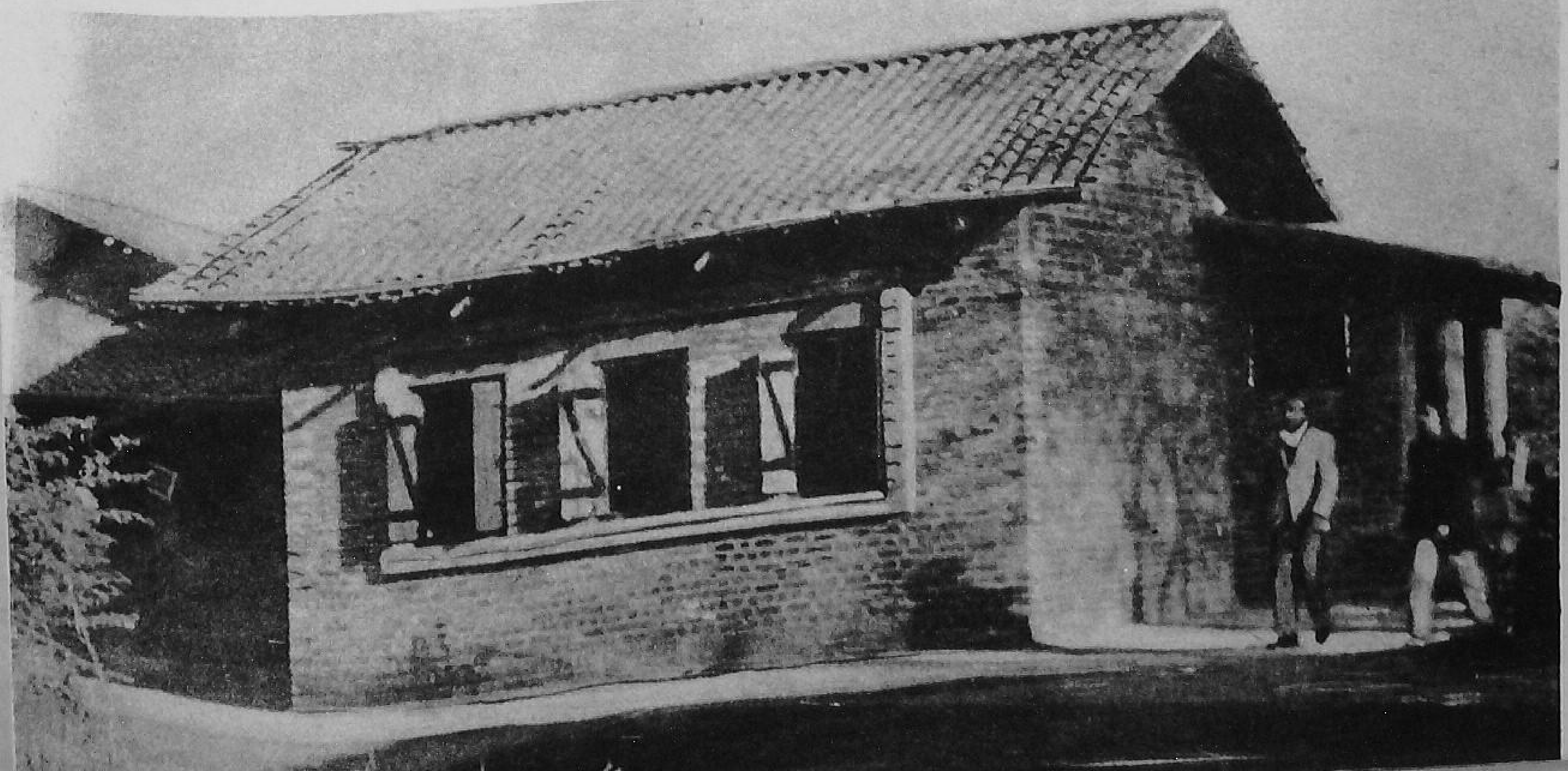
Materials :—

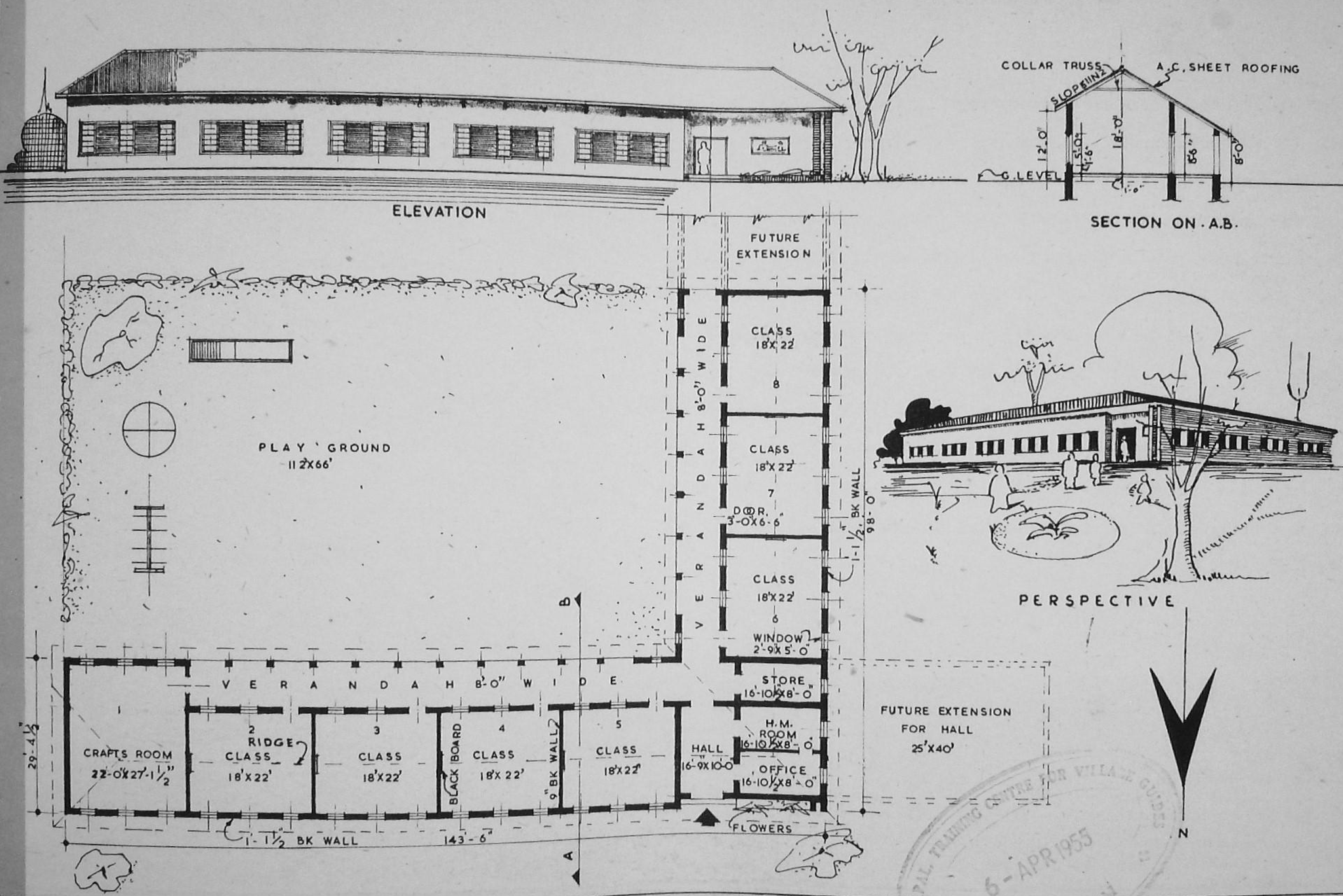
Cement	1·8 tons.
Sand	1600 cft.
Lime	510 cft.
Brick ballast 1½" gauge	860 cft.
Bricks	1,79,000 Nos.
Stone ballast ½" gauge	70 cft.
A. C. sheets	8,600 sft.
A. C. Ridging and valleys	95 pairs.
Salwood	130 cft.
Soft-wood	320 cft.
Solignum	14 gallons.
Hold-fasts	224 Nos.

Labour :—

Masons	15 Nos. for 30 days.
Beldars and coolies	35 Nos. for 30 days.
Carpenters	11 Nos. for 30 days.
Bhisti	1 No. for 30 days.
Painters	2 Nos. for 10 days.
Mistries	2 Nos. for 10 days.

This photograph shows a building which can be used as a school during the days and panchayatghar and library during the evenings. Local materials are used and it can be constructed in any North Indian village. Note three good sized windows for proper lighting in class rooms. The plinth is rammed earth and is raised to avoid damp.





TRAINING CENTRE FOR VILLAGE GUIDES
6 - APR 1955

DESIGN FOR A SECONDARY SCHOOL

DRG. NO. 11.

SCALE 0 4 8 12 16 32 48 64 IN FEET.

DESIGN FOR A PRIMARY HEALTH CENTRE

Plan No. 12 shows a design for a Primary Health Centre to meet the requirements of proper medical treatment of the villagers. The following provisions have been made for the treatment of indoor and out-door patients :—

Separate waiting halls for men and women ;

Doctors' room;

Antinatal room;

Dispensary;

Dressing room;

One four-bed ward;

One two-bed ward;

Duty room ; and

Office-cum-store.

The building has been designed with wide verandahs in order to provide ample ventilation. It can be constructed with local materials and the roof can be sloping with A.C. sheets, country or manglore tiles ; or a flat roof according to climatic conditions.

The cost of the building will vary from Rs. 8,500/- to Rs. 12,600/- at different places, for good specifications depending upon the local prices of materials and labour. If the labour is provided free by the villagers, the cost will vary from Rs. 4,250/- to Rs. 6,300/- for a semi permanent structure.

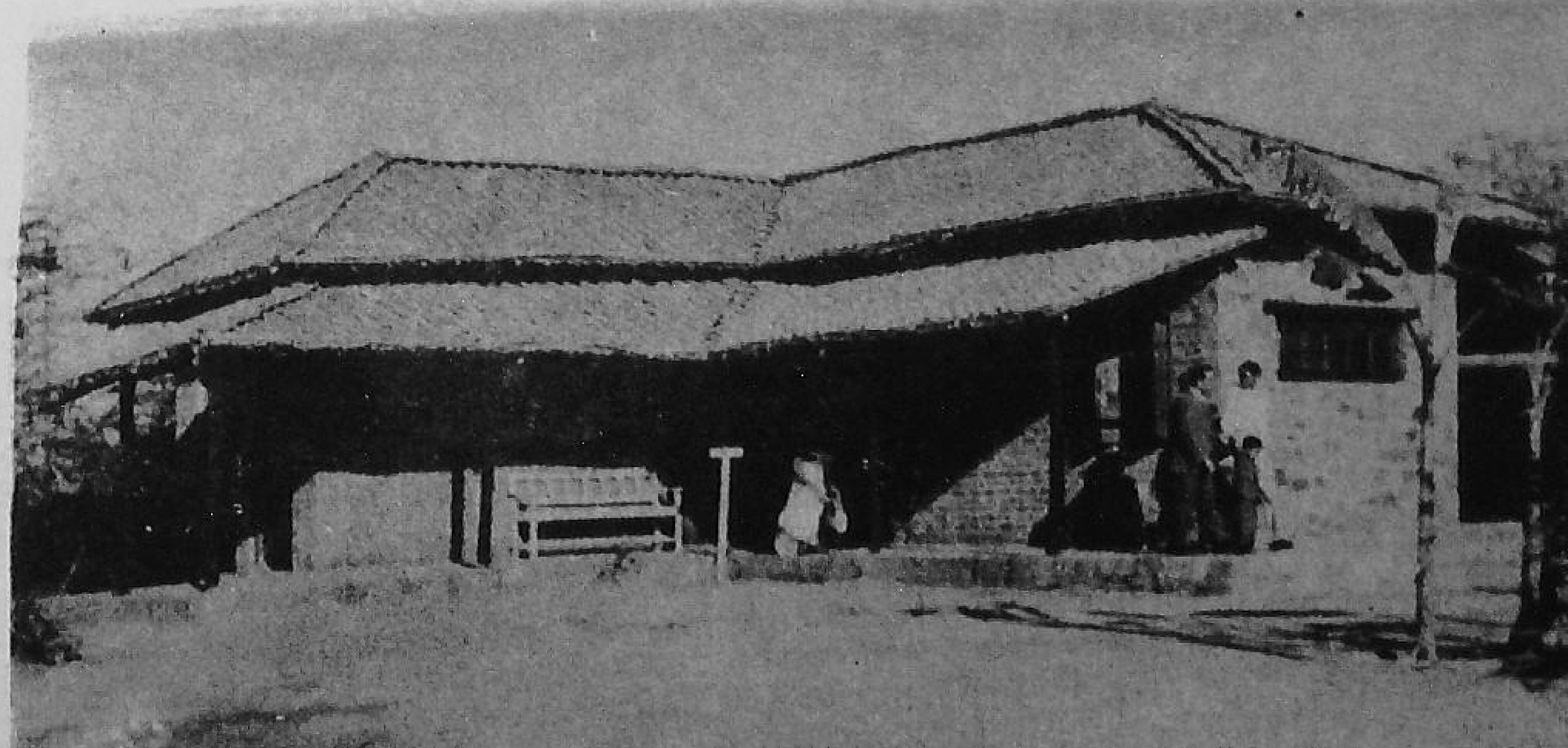
The approximate requirement of materials and labour for this building is given below :—

Materials :—

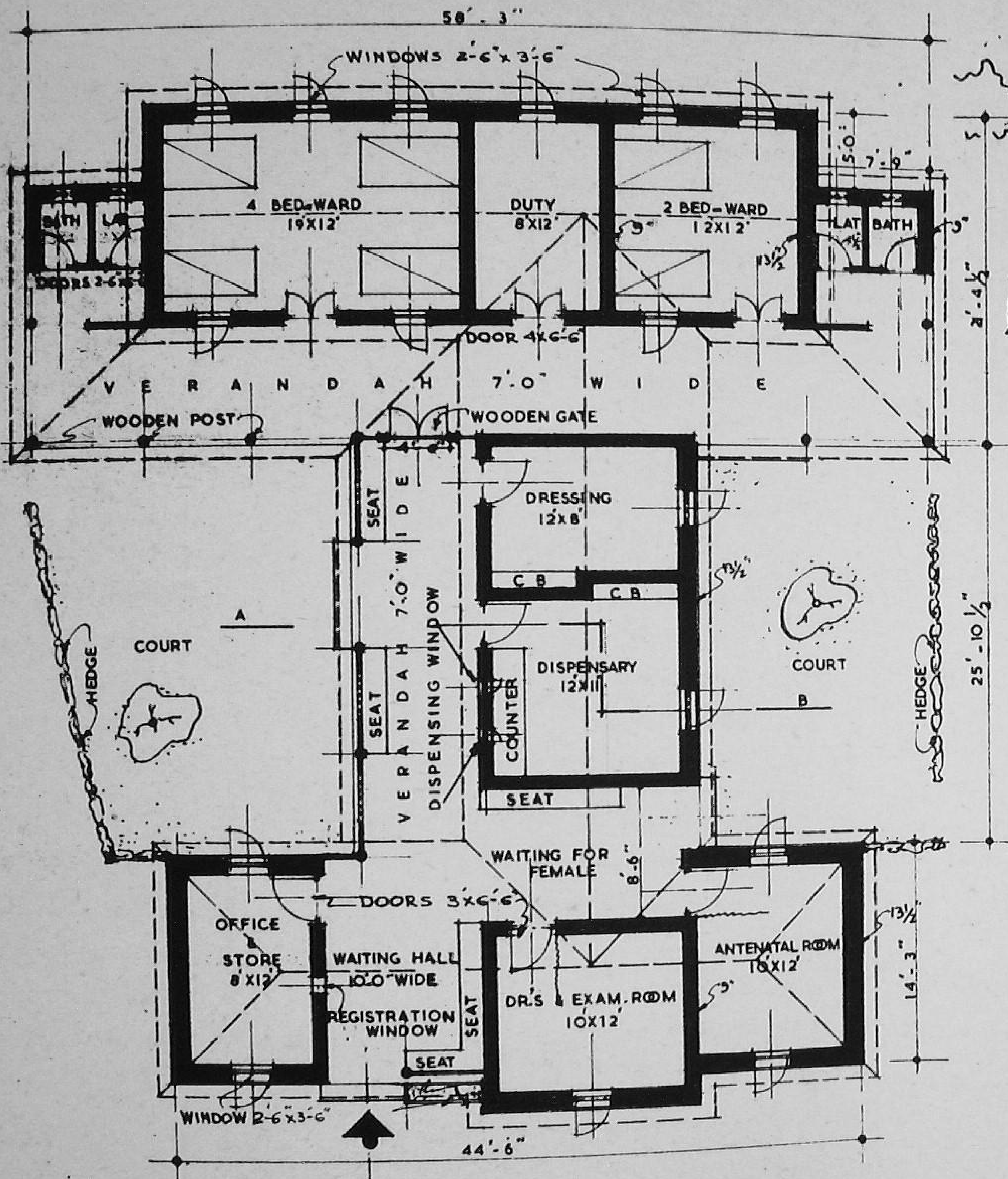
Cement	2·5 tons.
Lime	300 cft.
Sand	1000 cft.
Brick ballast $1\frac{1}{2}''$ gauge	970 cft.
Bricks	73,000 Nos.
Stone ballast $\frac{1}{2}''$ gauge	180 cft.
A. C. Sheets	3,440 sft.
A. C. Ridging and valleys	72 pairs.
Salwood	89 cft.
Soft-wood	173 cft.
Solignum	9 gallons.
Hold Fasts	142 Nos.
Sal-ballies 6" dia.	242 Rft.

Labour :—

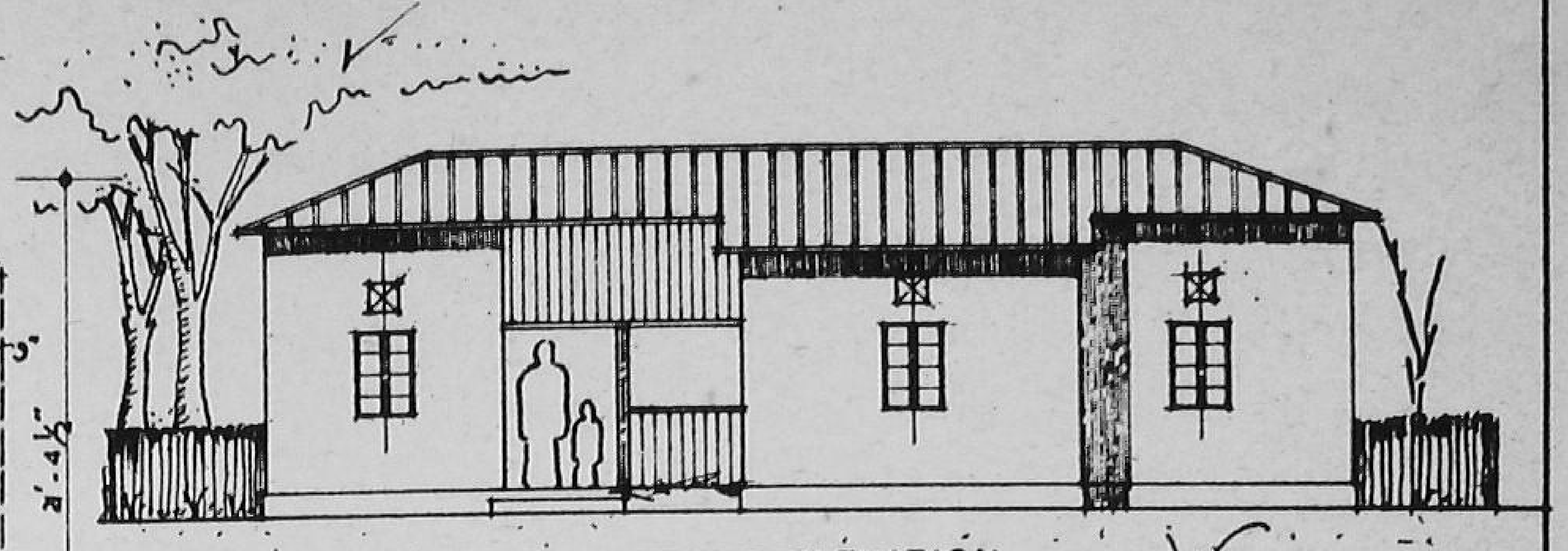
Masons	9 Nos. for 30 days.
Beldars and coolies	19 Nos. for 30 days.
Bhisties	2 Nos. for 30 days.
Carpenters	5 Nos. for 30 days.
Painter	1 No. for 15 days.
Mistry	1 No. for 10 days.

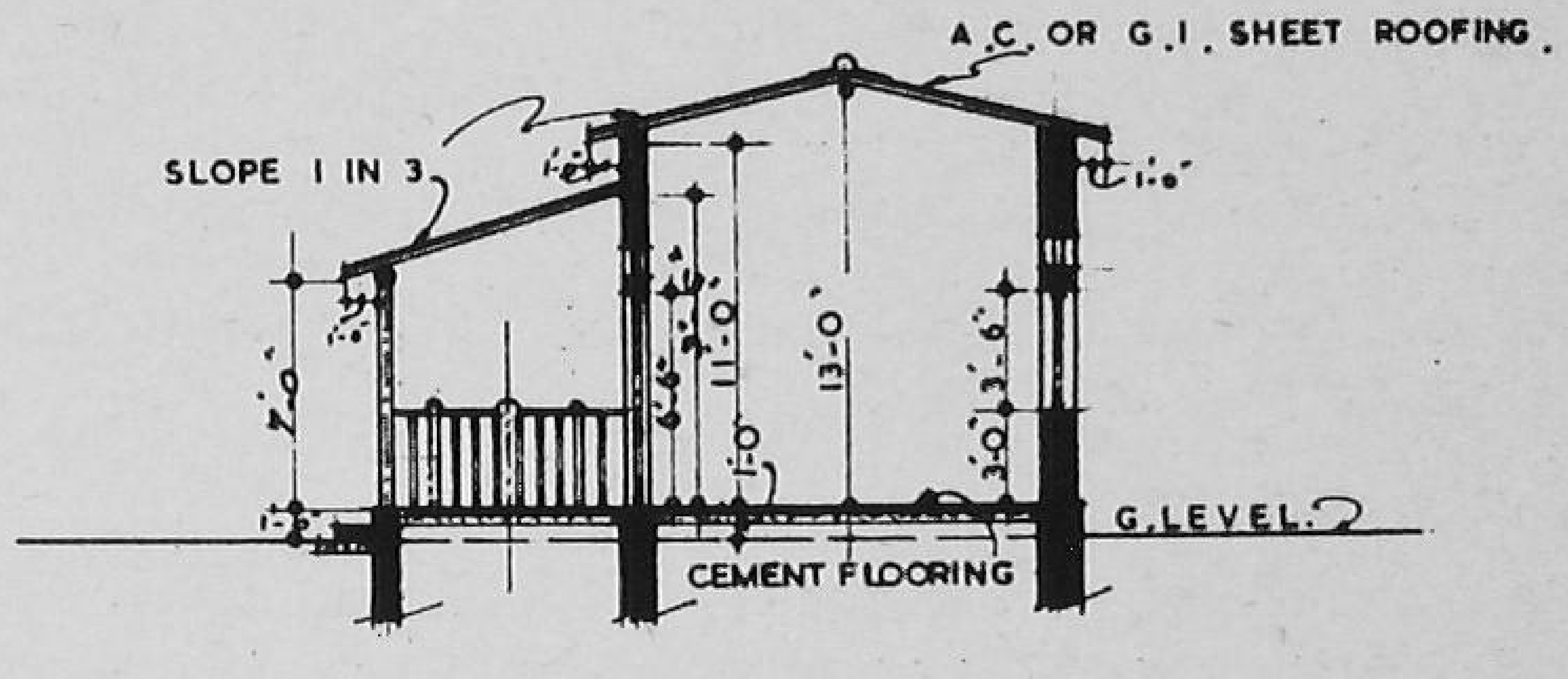


This building is the health centre which can be constructed in any village with local materials. Note the blending of materials, namely, bricks, stone and wood to give a pleasing and harmonious appearance.



PLAN


FRONT ELEVATION



SECTION ON A B

DESIGN FOR A PRIMARY HEALTH CENTRE

(WITH 6 BEDS)

DRG. NO. 12.

SCALE 0 2 4 6 8 16 24 32 IN FEET

DESIGN FOR A MULTI PURPOSE STAGE

Plan No. 13 shows the design of a multi-purpose stage which can be constructed at low-cost. The stage itself is housed in a simple hall 18′-6″ × 14′ with two adjoining rooms of 10′ × 11′ to serve as green rooms. The roof of the stage can be either of asbestos sheet, manglore tiles or country tiles. Simple decorations on the facade of the stage can be done at very small cost to make the stage attractive. The auditorium consists of a raised ground sloping towards the stage. Plants can be provided on either side with hedging or a masonry wall if funds permit. Spreading a few durries and erecting a shamiana would make the auditorium quite suitable on festive occasions. The cost of the multi-purpose stage will vary from Rs. 3,100/- to Rs 4,200/- at different places for good specifications, depending upon the local cost of materials and labour. If the labour is provided free of cost by the villagers, the cost will vary from Rs. 1,550/- to Rs. 2,100/- for a semi permanent structure. The approximate requirement of material and labour for constructing this building is given below :—

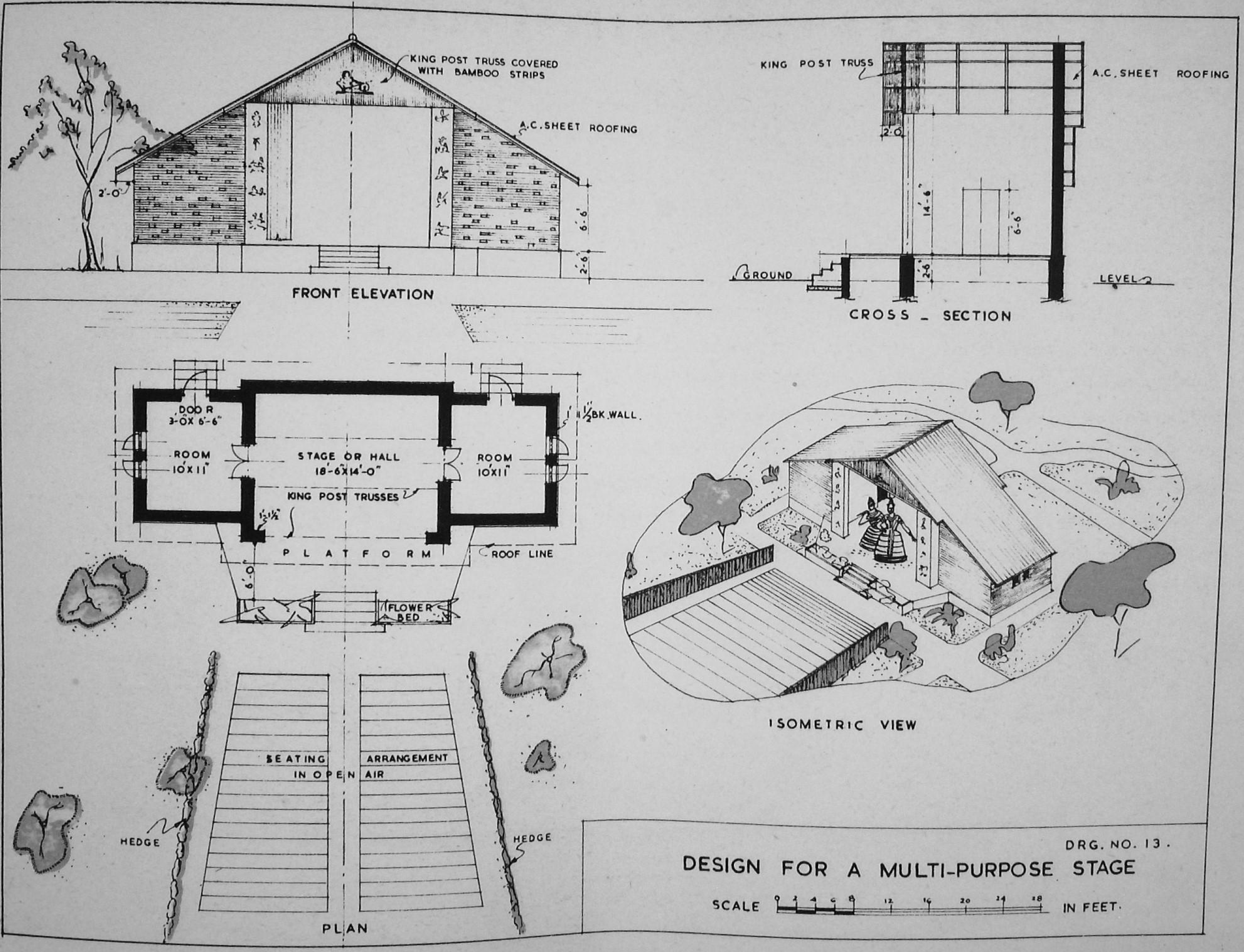
Materials :—

Cement	17 cwt.
Lime	50 cft.
Sand	200 cft.
Brick ballast 1½″ gauge	340 cft.
Bricks	36,000 Nos.
Sal-wood	17 cft.
Soft-wood	51 cft.
Bamboos	2 scores.
Solignum	2 gallons.
Stone ballast ½″ gauge	40 cft.
Hold-fasts	32 Nos.
A. C. Sheets	1220 sft.
A. C. Ridging	6 pairs.

Labour :—

Masons	7 Nos. for 15 days.
Beldars and coolies	15 Nos. for 15 days.
Bhisti	1 No. for 10 days.
Carpenters	4 Nos. for 10 days.
Painter	1 No. for 3 days.
Mistry	1 No. for 3 days.

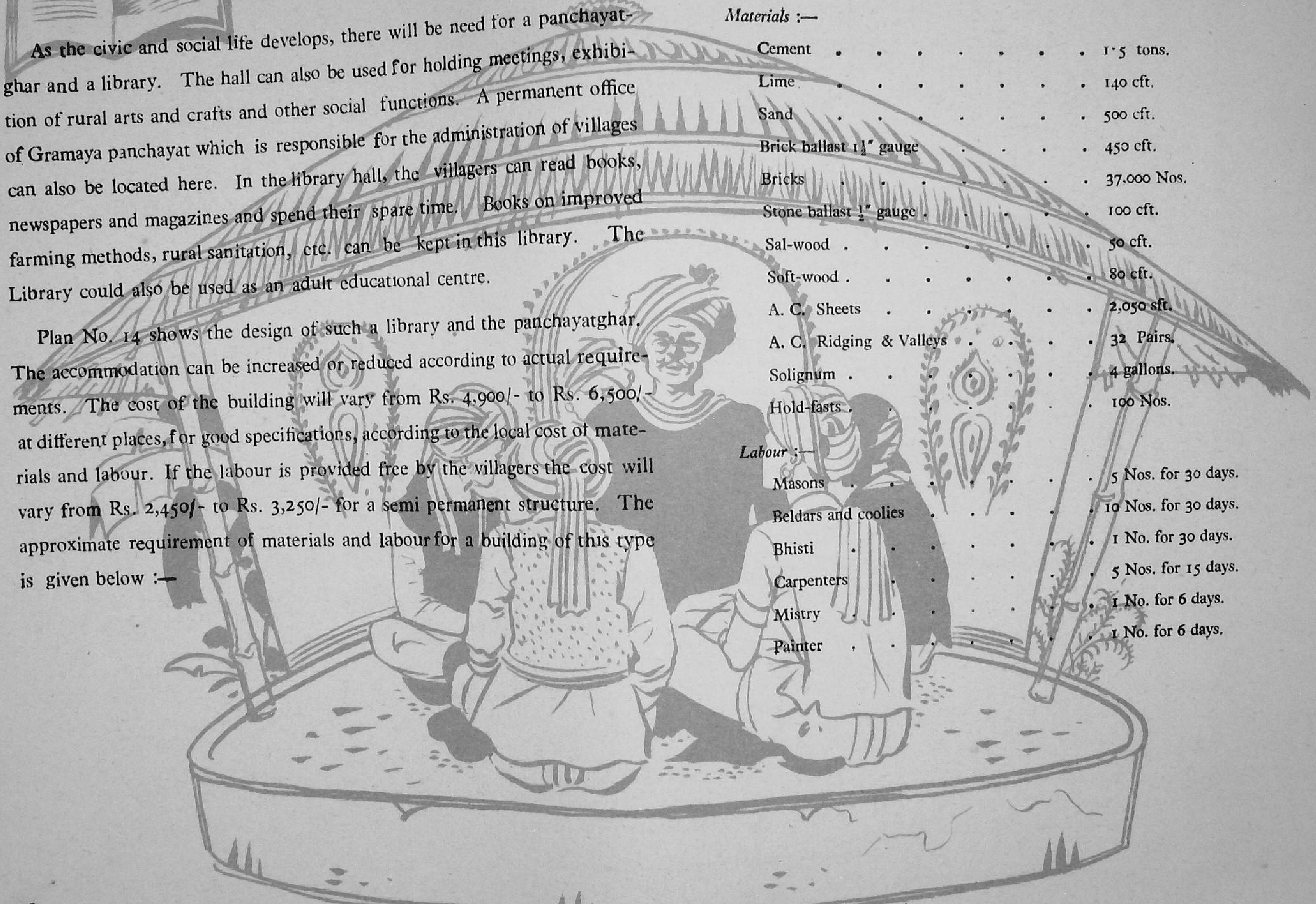
An open air theatre would provide a nucleus for social and dramatic activities in the village, Without much expenditure, the open air theatre, shown on the opposite page, can be constructed in any village with the cooperative efforts of the villagers .



DRG. NO. 13.

DESIGN FOR A MULTI-PURPOSE STAGE

DESIGN FOR A PANCHAYAT GHAR AND LIBRARY



As the civic and social life develops, there will be need for a panchayat-ghar and a library. The hall can also be used for holding meetings, exhibition of rural arts and crafts and other social functions. A permanent office of Gramaya panchayat which is responsible for the administration of villages can also be located here. In the library hall, the villagers can read books, newspapers and magazines and spend their spare time. Books on improved farming methods, rural sanitation, etc. can be kept in this library. The Library could also be used as an adult educational centre.

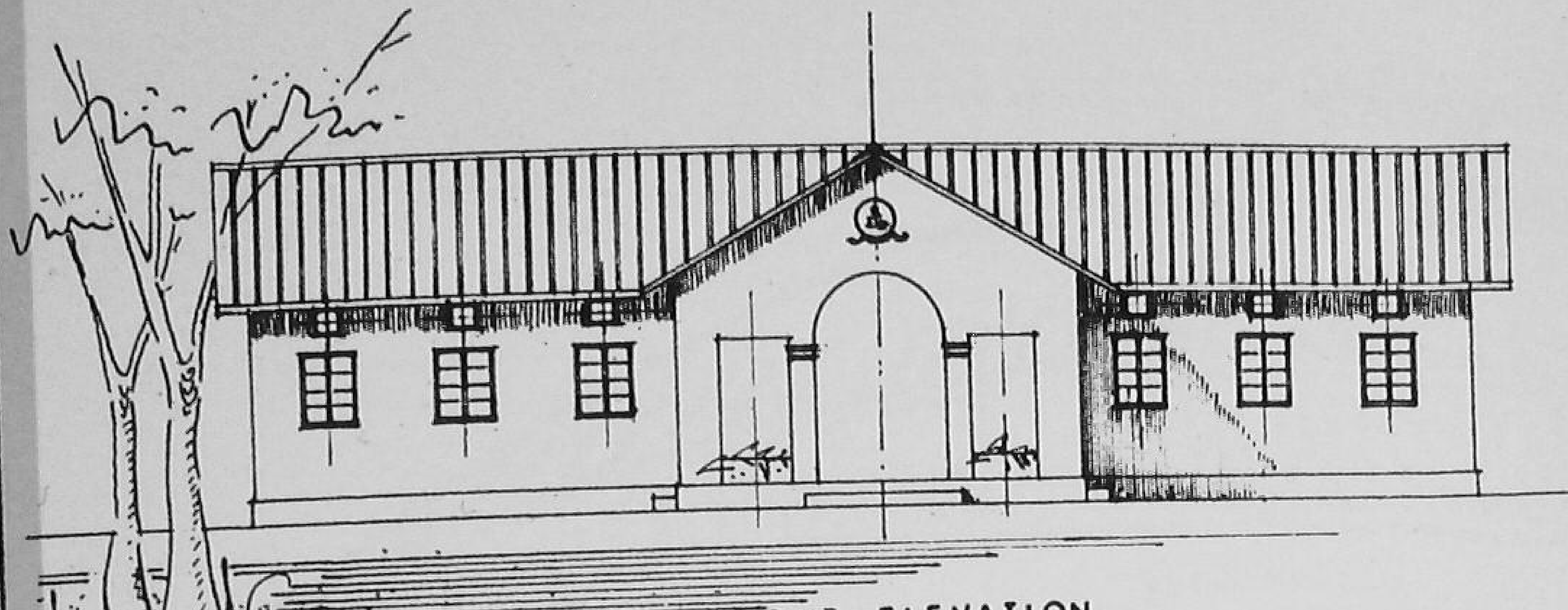
Plan No. 14 shows the design of such a library and the panchayatghar. The accommodation can be increased or reduced according to actual requirements. The cost of the building will vary from Rs. 4,900/- to Rs. 6,500/- at different places, for good specifications, according to the local cost of materials and labour. If the labour is provided free by the villagers the cost will vary from Rs. 2,450/- to Rs. 3,250/- for a semi permanent structure. The approximate requirement of materials and labour for a building of this type is given below :—

Materials :—

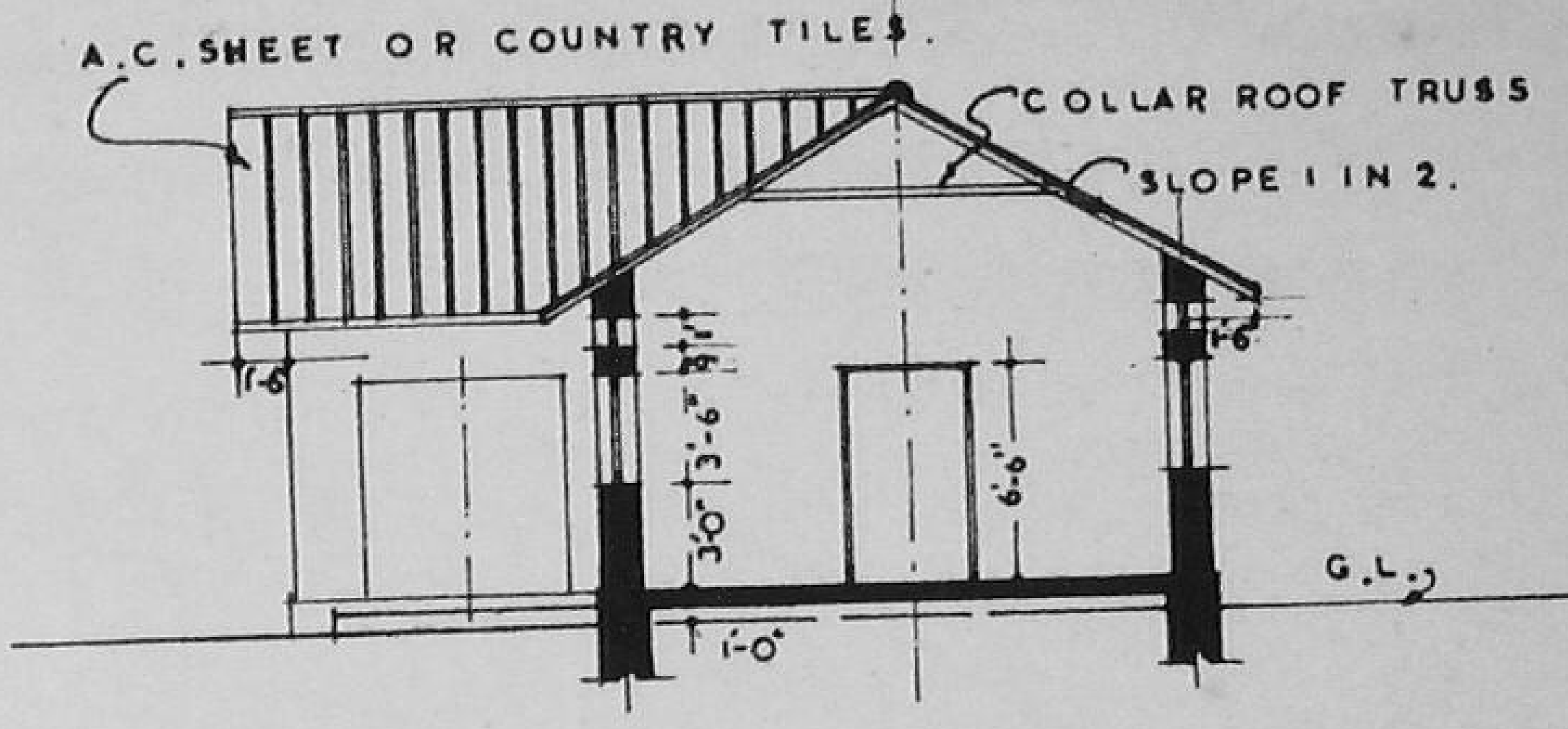
Cement	1·5 tons.
Lime	140 cft.
Sand	500 cft.
Brick ballast $1\frac{1}{2}''$ gauge	450 cft.
Bricks	37,000 Nos.
Stone ballast $\frac{1}{2}''$ gauge	100 cft.
Sal-wood	50 cft.
Soft-wood	80 cft.
A. C. Sheets	2,050 sft.
A. C. Ridging & Valleys	32 Pairs.
Solignum	4 gallons.
Hold-fasts	100 Nos.

Labour :—

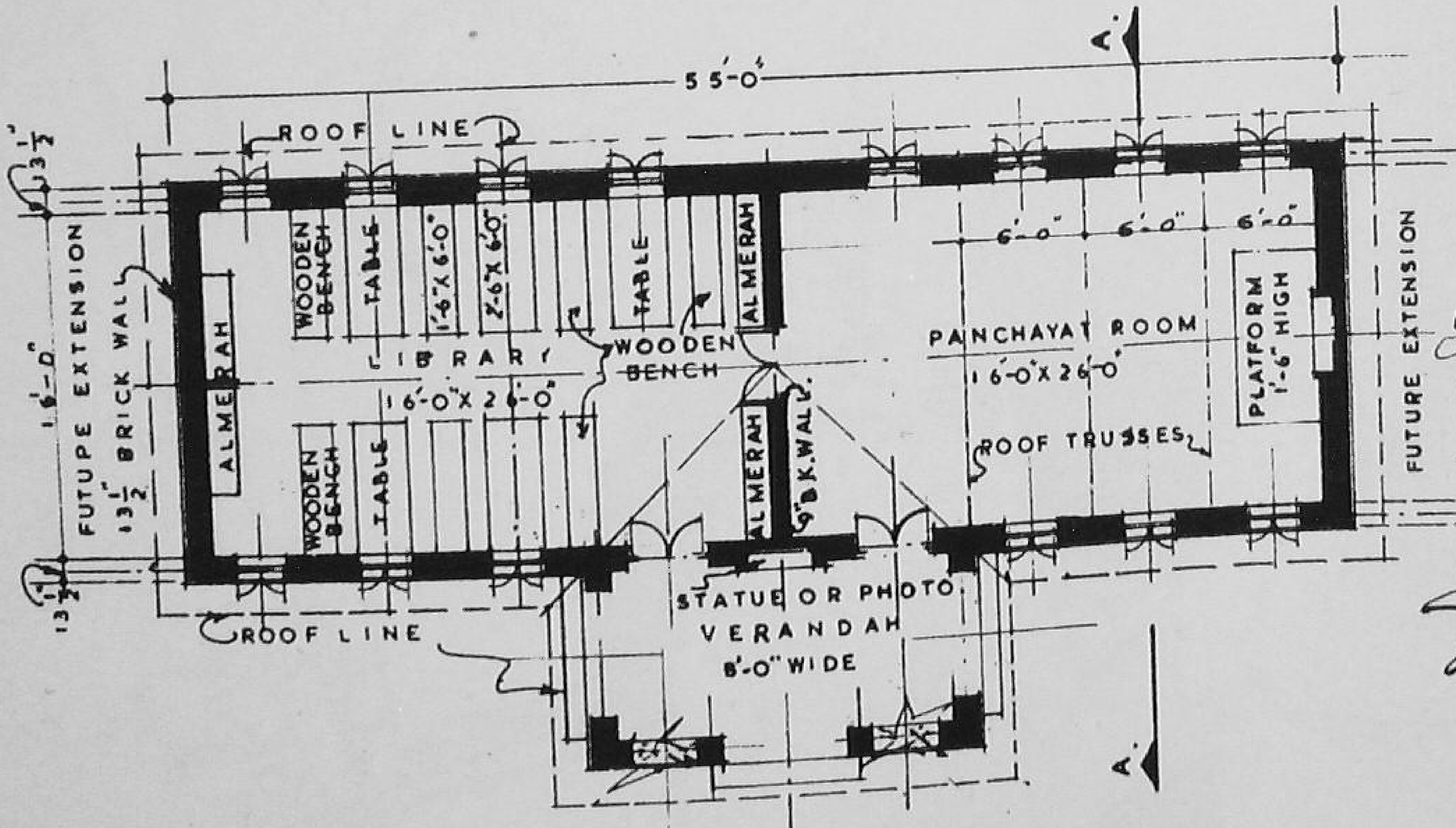
Masons	5 Nos. for 30 days.
Beldars and coolies	10 Nos. for 30 days.
Bhisti	1 No. for 30 days.
Carpenters	5 Nos. for 15 days.
Mistry	1 No. for 6 days.
Painter	1 No. for 6 days.



FRONT ELEVATION



SECTION ON A.A.



PLAN

DRG. NO. 14.

DESIGN FOR A PANCHAYAT GHAR & A LIBRARY

SCALE 0 2 4 6 8 12 16 24 32 IN FEET

DESIGN FOR A WHOLESALE MARKET CENTRE

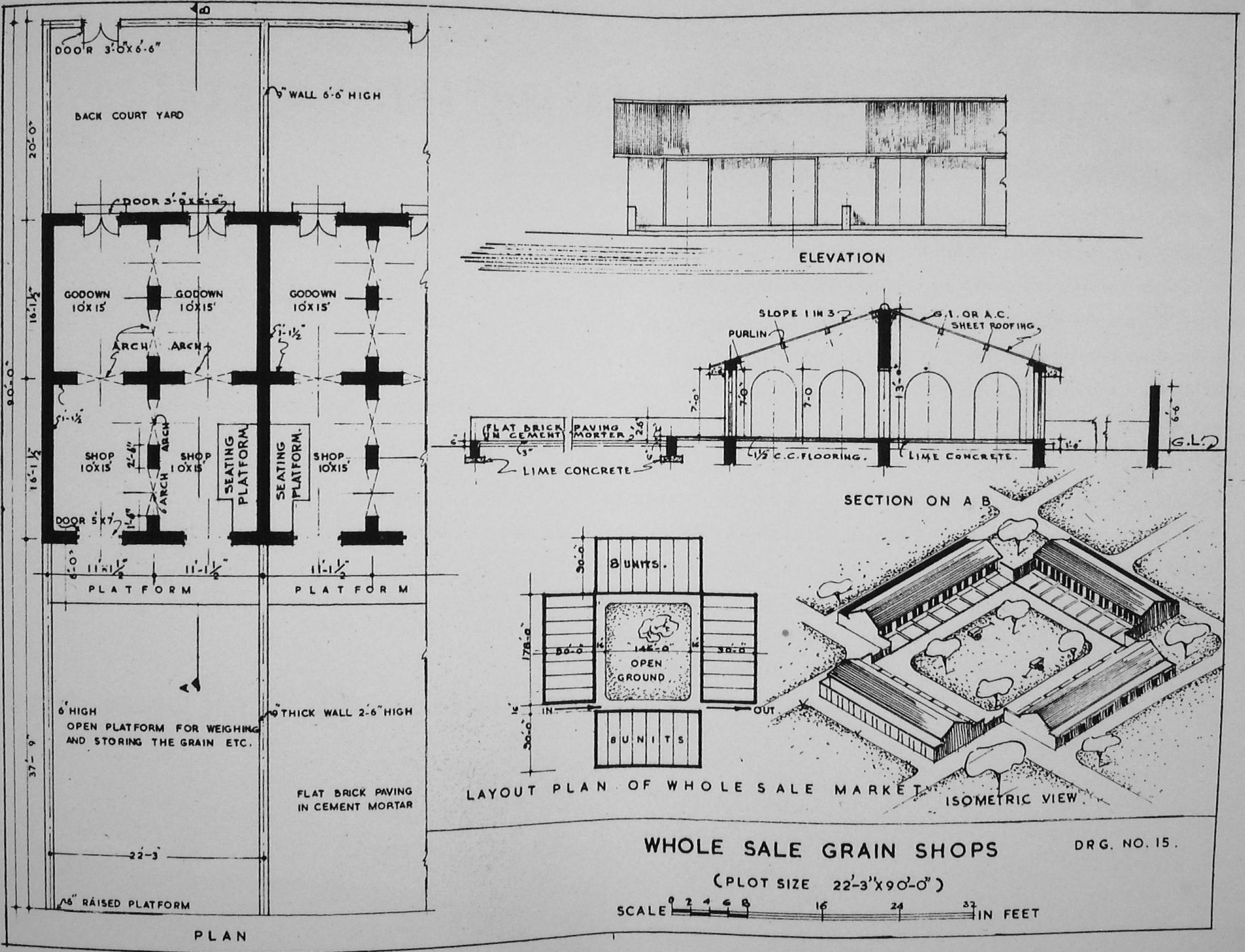
A wholesale market centre is necessary for a group of villages for buying and disposing of their produce. Plan No. 15 shows the design of such a centre. This centre comprises of 4 blocks, each block having 8 units and each unit being built on a plot of 22′-3″ × 90′-0″. The actual business of buying and selling can be carried on in the front portion of each unit and the grain store at the rear. During the dry weather the back courtyard can also be used for additional storing. Each unit of accommodation can also be sub-divided into two by filling in of the arch openings. The roof can be either of A.C.or G.I. sheets according to the climatic conditions of the locality. The cost of this accommodation will vary from Rs. 2,900/- to Rs. 3,800/- at different places, for good specifications depending upon the availability and local cost of materials and labour. If the labour is provided free by the villagers, the cost will vary from Rs. 1,450/- to Rs. 1,900/- for a semi permanent structure. The approximate requirement of material and labour per unit of this accommodation is given below:—

Materials :—

Cement	1.9 tons.
Lime	110 cft.
Sand	450 cft.
Brick ballast 1½″ gauge	400 cft.
Bricks	29,000 Nos.
Soft-wood	45 cft.
Stone ballst ½″ gauge	100 cft.
Hold-fasts	24 Nos.
G. I. Sheets 24 B. W. G.	0.6 tons.
G. I. Ridging	0.03 tons.
Solignum	2 gallons.

Labour :—

Masons	8 Nos. for 15 days.
Beldars and Coolies	14 Nos. for 15 days.
Bhistis	2 Nos. for 10 days.
Carpenters	4 Nos. for 10 days.
Painter	1 No. for 2 days.
Mistry	1 No. for 3 days.



DOOR 3'-0"X6'-6"
9" WALL 6'-6" HIGH
BACK COURT YARD
20'-0"
DOOR 3'-0"X5'-6"
GODOWN 10'X15'
GODOWN 10'X15'
GODOWN 10'X15'
ARCH
ARCH
1'-1½"
16'-1½"
90'-0"
SHOP 10'X15'
SHOP 10'X15'
SHOP 10'X15'
SEATING PLATFORM.
SEATING PLATFORM.
DOOR 5'X7'
11'-1½"
11'-1½"
11'-1½"
PLATFORM
PLATFORM
6' HIGH
OPEN PLATFORM FOR WEIGHING AND STORING THE GRAIN ETC.
9" THICK WALL 2'-6" HIGH
FLAT BRICK PAVING IN CEMENT MORTAR
37'-9"
22'-3"
6" RAISED PLATFORM
PLAN
ELEVATION
SLOPE 1 IN 3
G.I. OR A.C. SHEET ROOFING
PURLIN
FLAT BRICK PAVING IN CEMENT MORTER
1½" C.C. FLOORING.
LIME CONCRETE.
LIME CONCRETE
G.L.
SECTION ON A B
8 UNITS.
OPEN GROUND
145'-0"
30'-0"
IN
OUT
8 UNITS
LAYOUT PLAN OF WHOLE SALE MARKET
ISOMETRIC VIEW.
WHOLE SALE GRAIN SHOPS
DRG. NO. 15.
(PLOT SIZE 22'-3"X90'-0")
SCALE 0 2 4 6 8 16 24 32 IN FEET

DESIGN FOR A RETAIL SHOP-CUM-RESIDENCE

Plan No. 16 shows the design for a block consisting of shops and residences. Each block may consist of 6 to 8 units in order to save on common walls and services. Each unit of accommodation is built on a plot of 12′-9″×60′-0″. This type of accommodation is suitable for the retail shop keepers. The front room can be used as a shop, while the rear room and the verandah can serve as a living unit.

The roof of this building can be constructed either with A.C. or G.I. Sheets, tiles or flat roof to suit local climatic conditions. The approximate cost of each unit will vary from Rs. 1,600/- to Rs. 2,100/- at different places, for good specifications according to the availability and cost of materials and labour. If the labour is provided free by the villagers, the cost will vary from Rs. 800/- to Rs. 1,050/- for a semi permanent structure. The approximate requirement of materials and labour per unit of this accommodation is given below:—

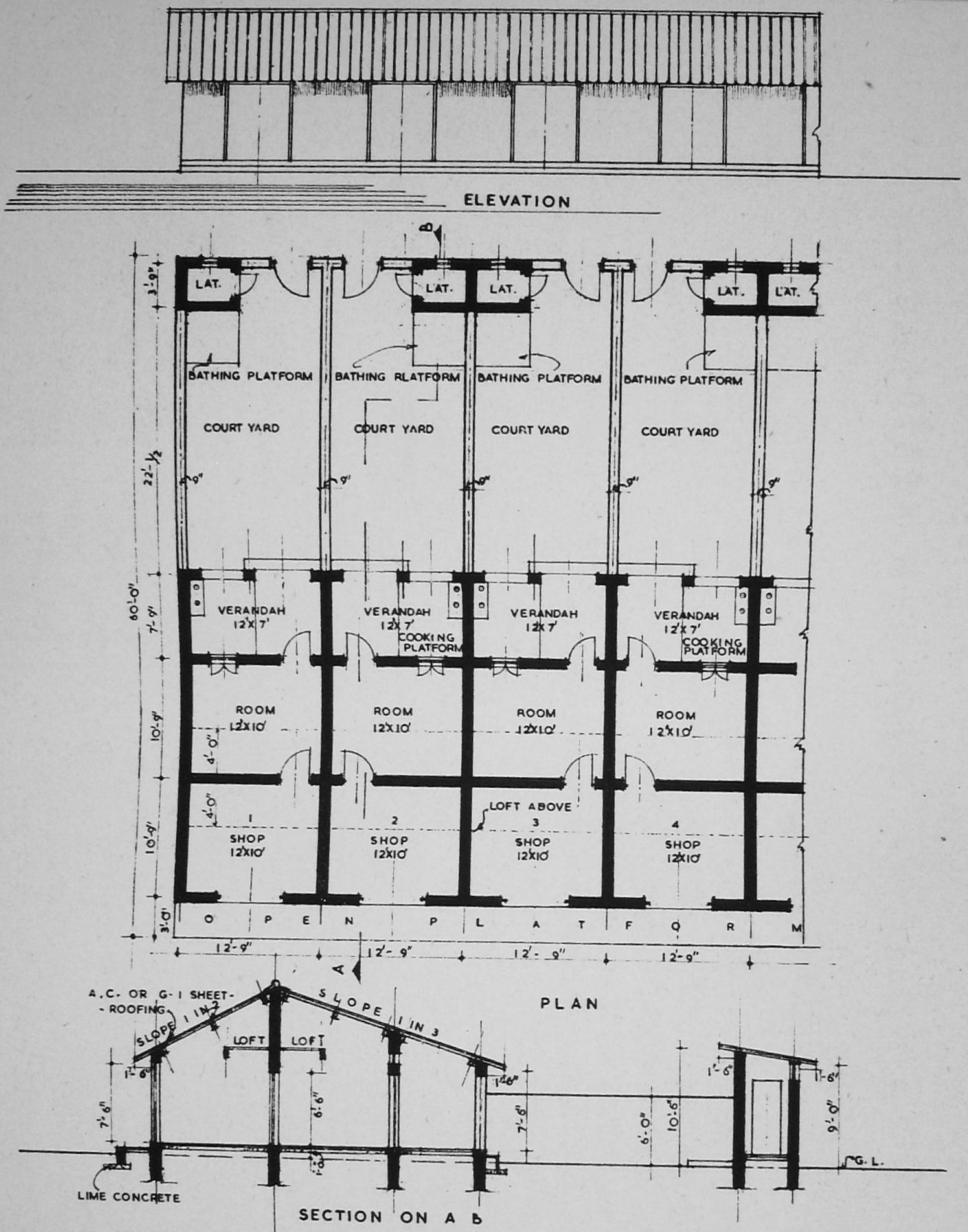
Materials :

Cement	0.4 tons.
Lime	54 cft.
Sand	200 cft.
Brick ballast 1½″ gauge	130 cft.
Bricks	13,000 Nos.
Soft-wood	52 cft.
Stone ballast ½″gauge	13 cft.
Hold-fasts	18 Nos.
A. C. sheets	600 sft.
A. C. Ridging & valleys	4 pairs
M. S. Bars	25 lbs.
Solignum	3 gallons.
Precast concrete jali	1 sft.
Precast R.C.C. Seat for borehole latrine	1 No.

Labour :

Masons	4 Nos. for 15 days.
Beldars and coolies	8 Nos. for 15 days.
Bhisti	1 No. for 15 days.
Carpenters	2 Nos. for 15 days.
Painter	1 No. for 3 days.
Mistry	1 No. for 3 days.

A typical house for an artisan. The working space is a part of the house. This is necessary in villages for the houses of artisans like carpenters, black-smiths, potters, etc. Requirement of working space should be kept in view in designing houses for artisan.



RETAIL SHOPS WITH RESIDENCE

DRG. NO. 16.

SCALE 0 2 4 6 8 16 24 32 IN FEET

DESIGN FOR A BUS STAND

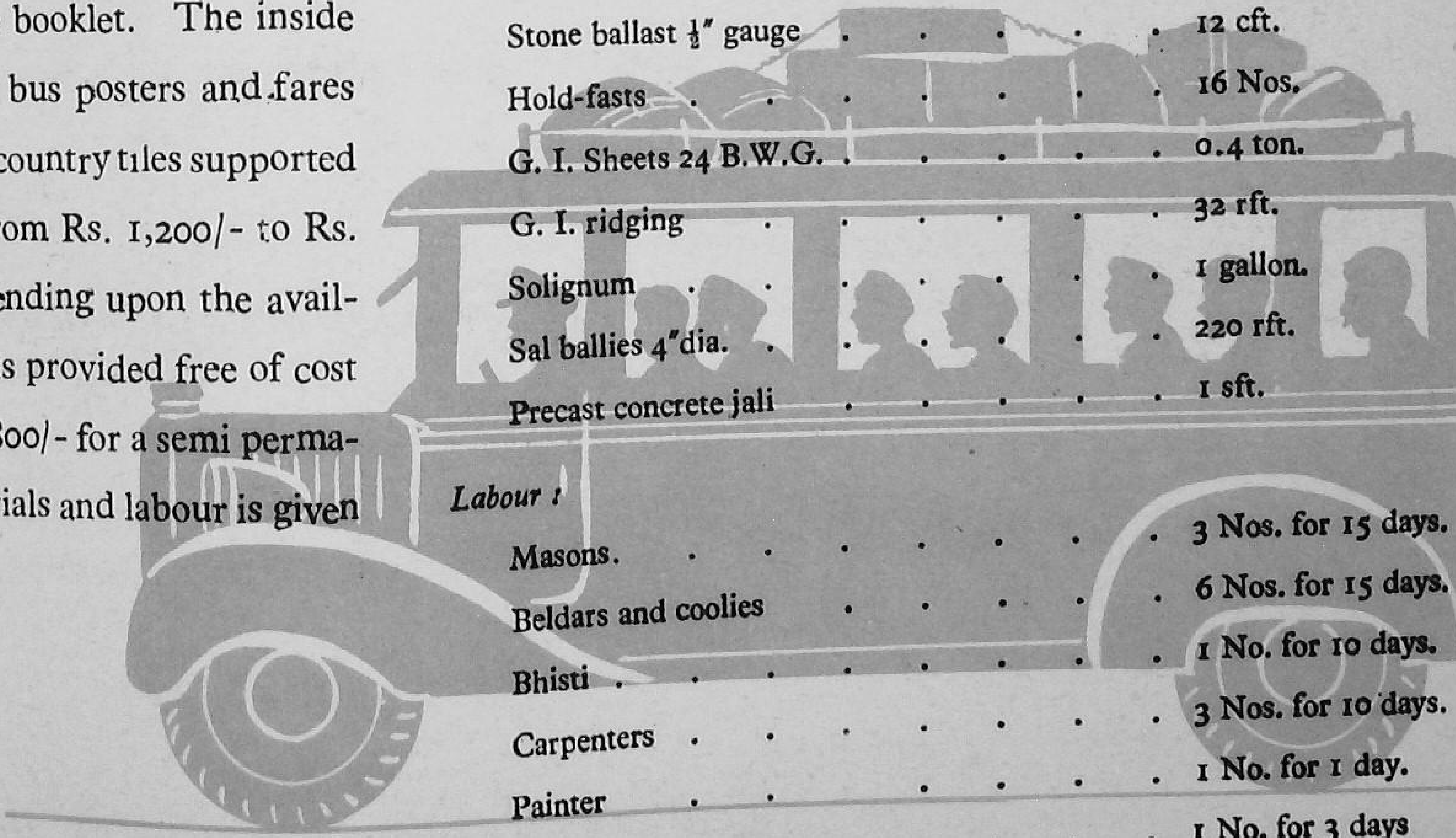
Buses have now become a common mode of transport in the villages. Just as at railway stations, waiting rooms for bus passengers have become a necessity; Plan No. 17 shows the design for a small waiting room for the bus passengers. At the end of the building provision has been made for a store which could also be used as a booking office and a small tea-stall to serve light refreshments to passengers. A latrine block can also be provided adjoining this waiting place based on one of the designs given in this booklet. The inside wall space of the waiting hall can be used for carrying bus posters and fares etc. The roof of the building consists of A.C. Sheets or country tiles supported on wooden rafters. The cost of a building will vary from Rs. 1,200/- to Rs. 1,600/- at different places, for good specifications depending upon the availability and cost of materials and labour. If the labour is provided free of cost by the villagers, the cost will vary from Rs.600/- to Rs. 800/- for a semi permanent structure. The approximate requirement of materials and labour is given below:—

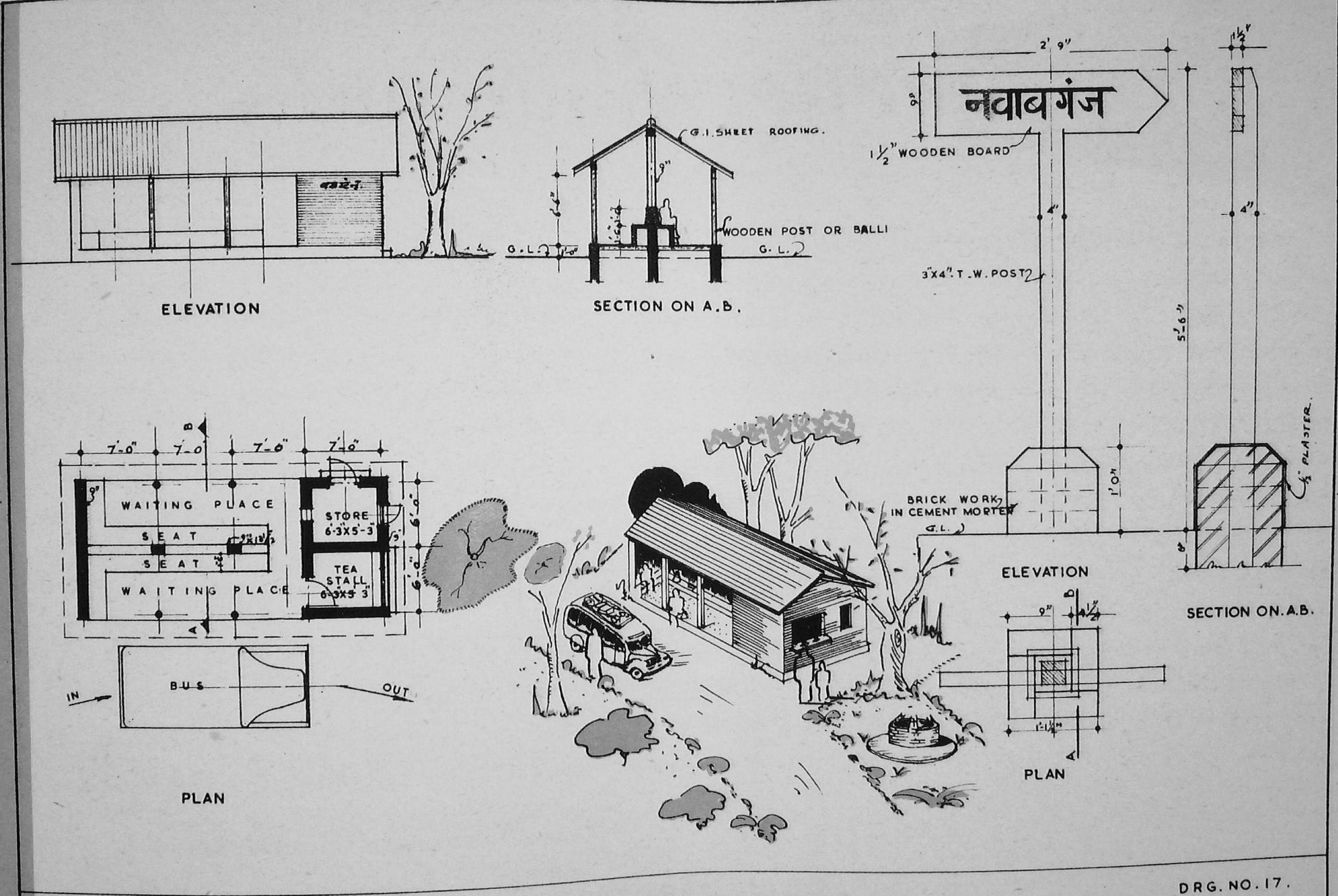
Materials :

Cement	4 cwt.
Lime	40 cft.
Sand	130 cft.
Brick ballast 1½" gauge	110 cft.
Bricks	10,000 Nos.
Soft-wood	23 cft.
Stone ballast ½" gauge	12 cft.
Hold-fasts	16 Nos.
G. I. Sheets 24 B.W.G.	0.4 ton.
G. I. ridging	32 rft.
Solignum	1 gallon.
Sal ballies 4"dia.	220 rft.
Precast concrete jali	1 sft.

Labour :

Masons.	3 Nos. for 15 days.
Beldars and coolies	6 Nos. for 15 days.
Bhisti	1 No. for 10 days.
Carpenters	3 Nos. for 10 days.
Painter	1 No. for 1 day.
Mistry	1 No. for 3 days





DRG. NO. 17.

DESIGN FOR A BUS-STAND & SIGN POST

SCALE IN FEET

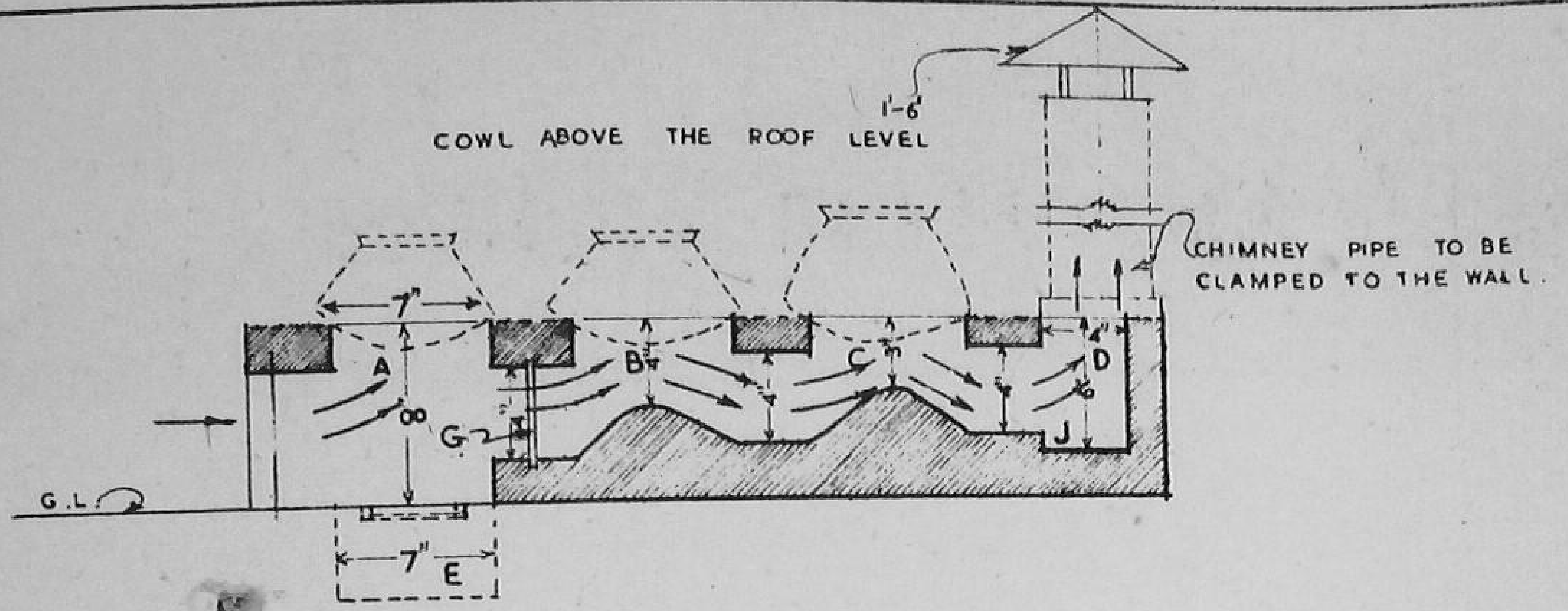
SCALE IN FEET

DESIGN FOR A SMOKELESS KITCHEN

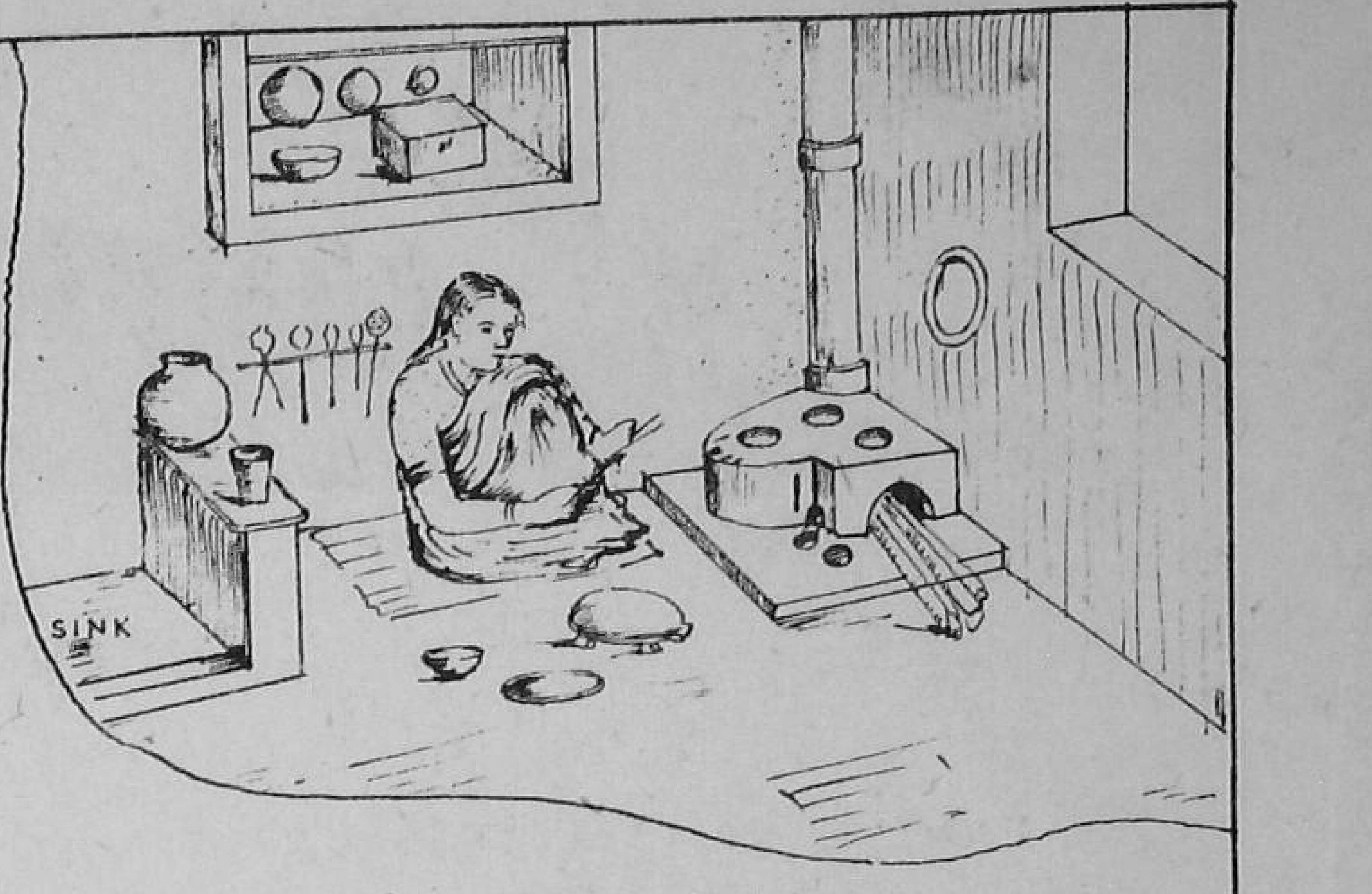
The kitchen in an Indian house plays an important part in the health and happiness of a family. The lady of the house has to be provided with full facilities to enable her to run a healthy and happy home. With this object in view, an ideal smoke less kitchen, as shown in the plan No. 18 has been evolved. In order to prevent smoke enveloping the kitchen, a smokeless "Magan Choola" has been provided. Wood fuel is used for feeding this choola and the smoke is taken outside the kitchen through a simple chimney, which can either be of ordinary clay pipes, or asbestos or tin pipes. The arrangement in this choola is such that the heat produced from the fuel is utilised fully and heat radiation is considerably minimised; thus making the kitchen a cool and comfortable place. Cooking can be done simultaneously in three different parts, at points 'A', 'B' and 'C'; point 'A' giving the maximum heat. The details regarding the construction of this choola are given in plan No. 19.

A sink 2′-3″ square, sunk 6″ below the ground level has been provided for washing pots and pans. A 2′-0″ high wall has been provided alongside the sink for water pots. Rows of shelves have been provided by the side of the choola for keeping utensils and stores. A good sized window by the side of the choola will give proper light and ventilation. The whole arrangement is such that maximum space is available for cooking and dining.

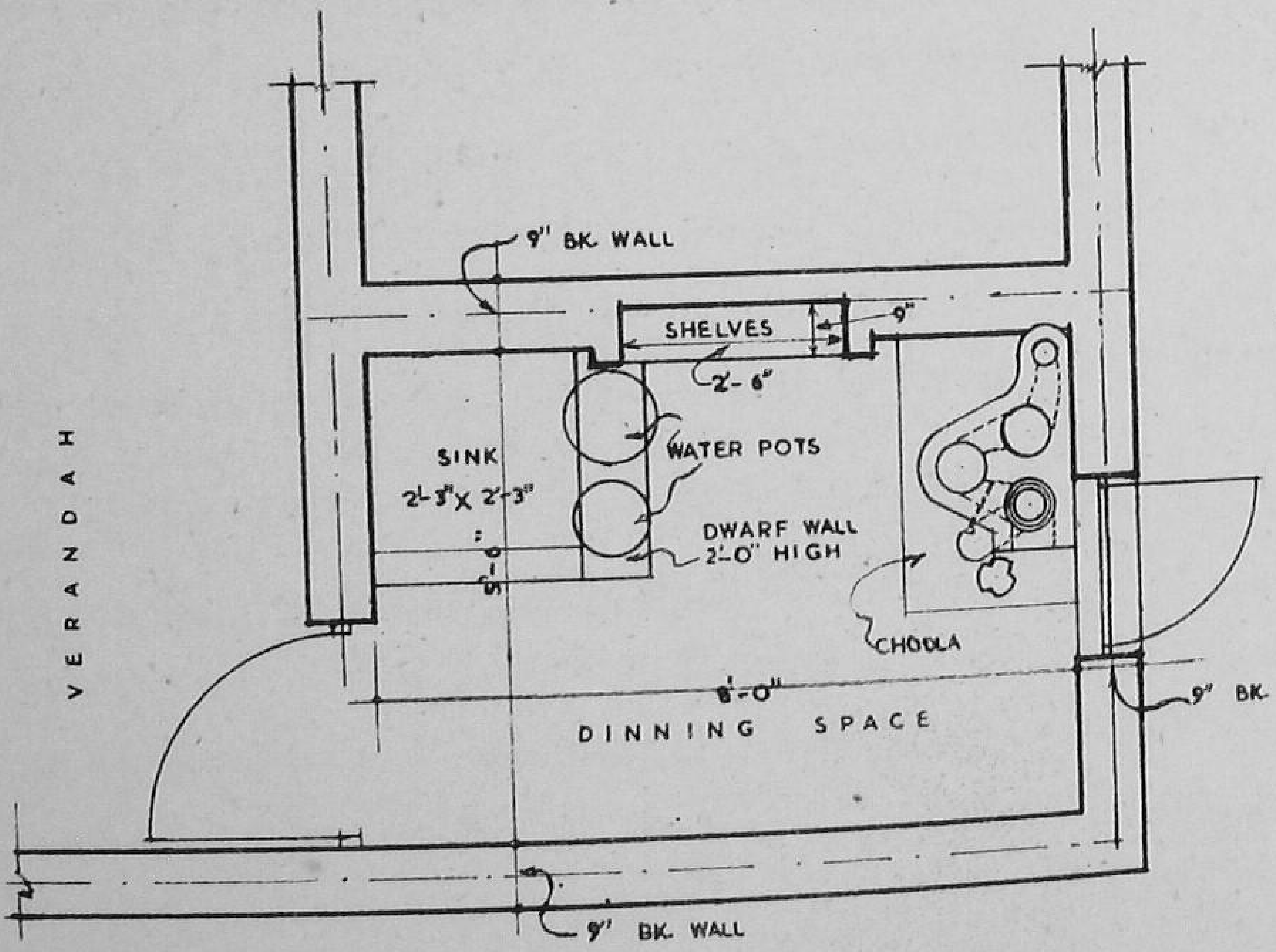
The cost of one Magan Choola as per details given in plan No. 19 is estimated to cost about Rs. 10/-.



SECTION THRO. CHOOLA



INTERIOR VIEW OF KITCHEN



PLAN OF A KITCHEN

A.B.C.....POT SEATS.

D.....CHIMNEY BASE.

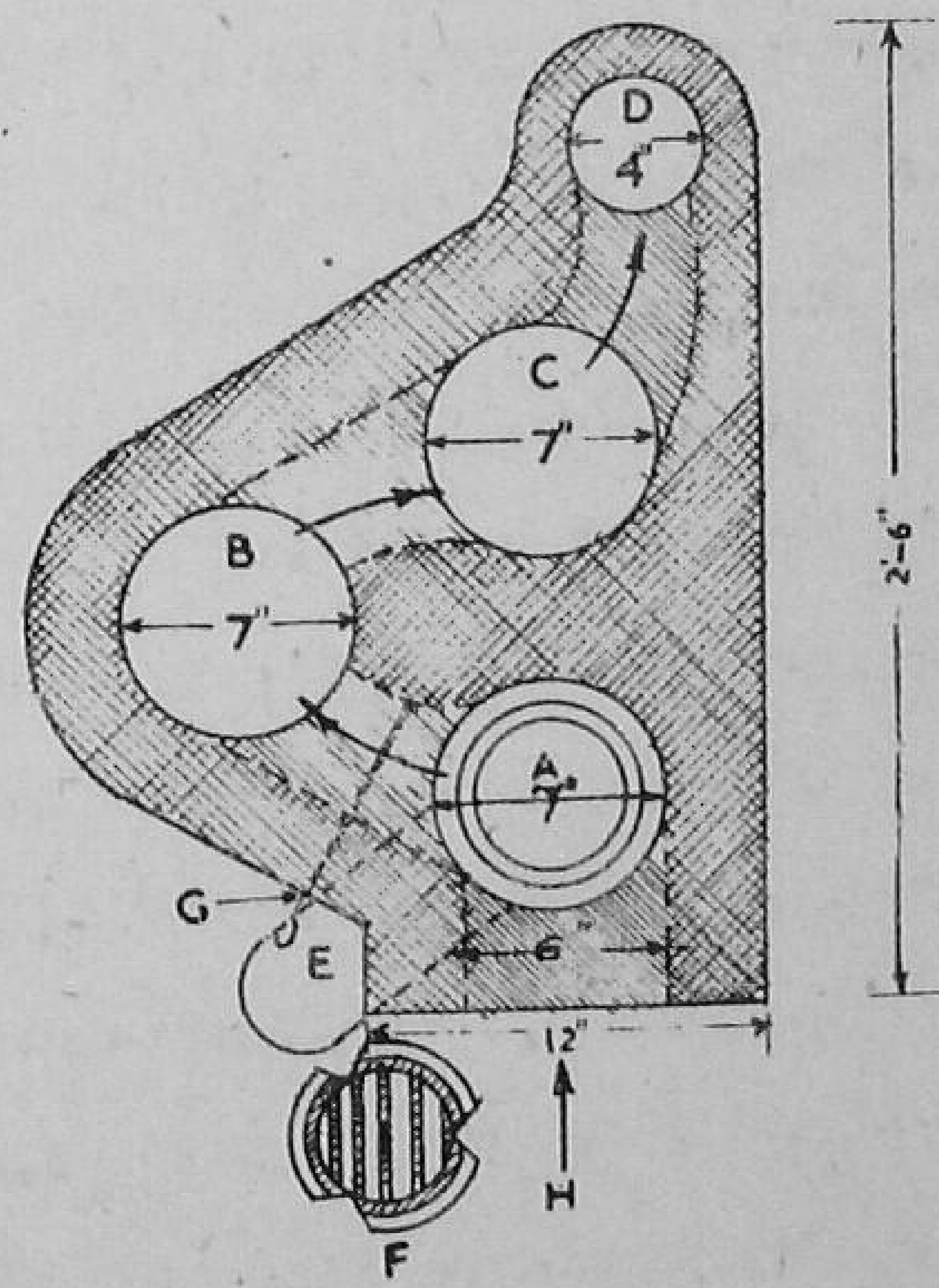
E...ASH REMOVING PIT & ADDITIONAL AIR VENT.

F....CHARCOAL STOVE ON FLOOR LEVEL FOR ROTI BAKING

G.... DAMPER THROUGH CHOOLA WALL.

H FUEL FEED.

J CHIMNEY PIT FOR SOOT ACCUMULATION



PLAN OF MAGAN CHOOLA

WITH THE COURTESY OF ALL INDIA VILLAGE INDUSTRIES ASSOCIATION, MAGAN VADI, WARDHA, M.P.

DRG. NO. 18.

DESIGN FOR A SMOKELESS KITCHEN
(WITH MAGAN CHOOLA)

HOW TO PREPARE A MAGAN CHOOLA

Materials required: As shown in plan No. 19.

Accessories:—

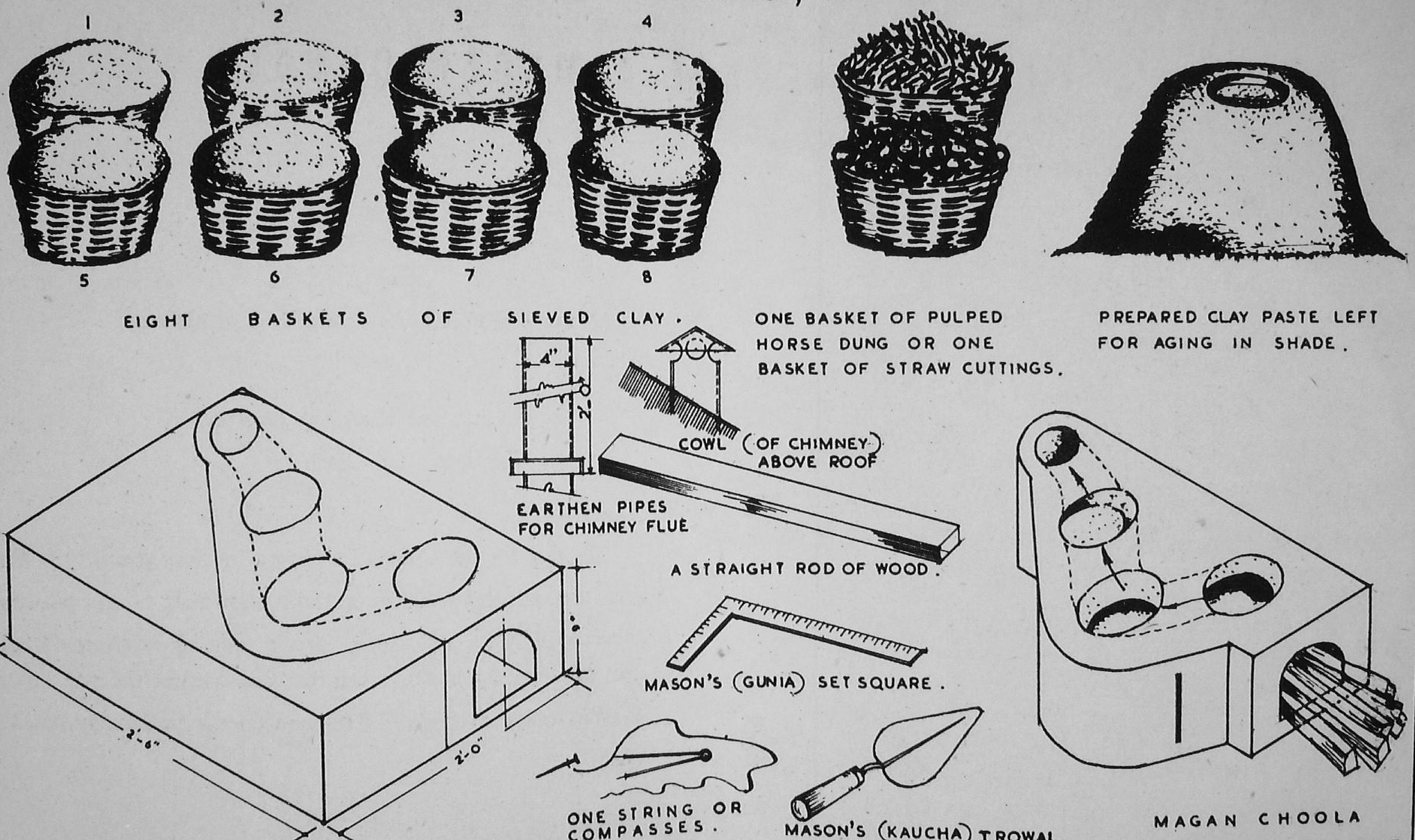
(1) Grating. (2) Ring. (3) Damper.

(4) Claypipes. (5) Cowl.

Process:—

The clay for the Choola should not be very plastic. As fibrous material gives strength and restricts cracking, cow-dung or chopped straw should be mixed with clay. The choola should then be constructed according to plan No. 19. Care should be taken that the seats for the pots are properly made to avoid leakage of smoke. The connection with chimney should also be smoke-tight.

WITH THE COURTESY OF ALL INDIA VILLAGE INDUSTRIES ASSOCIATION, MAGAN VADI WARDHA, M.P.



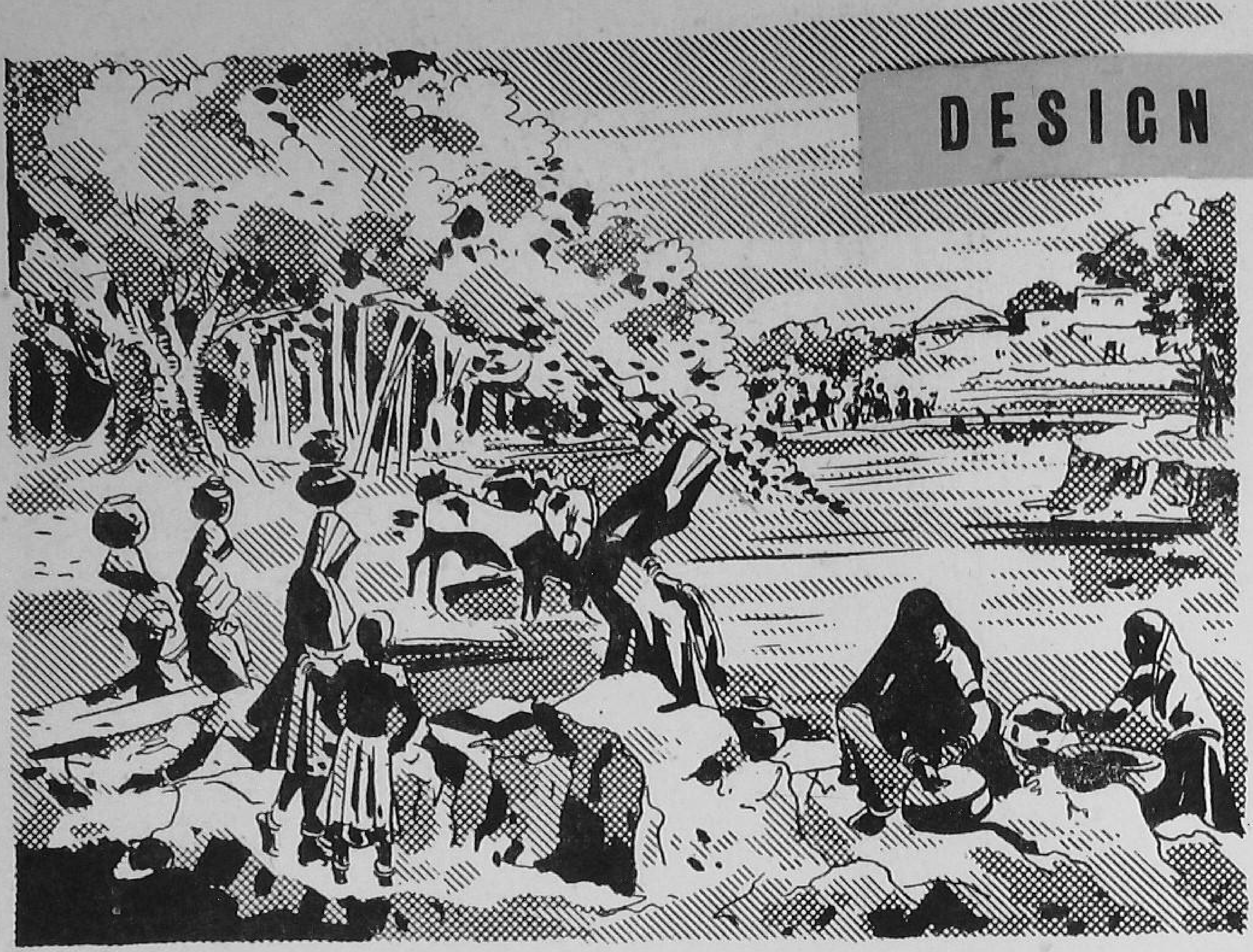
CLAY SLAB (2'-6" X 2'-0" X 0'-9") WITH PLAN DRAWN ON IT.

TOOLS REQUIRED FOR PREPARATION OF MAGAN CHOOLA.

DRG. NO. 19.

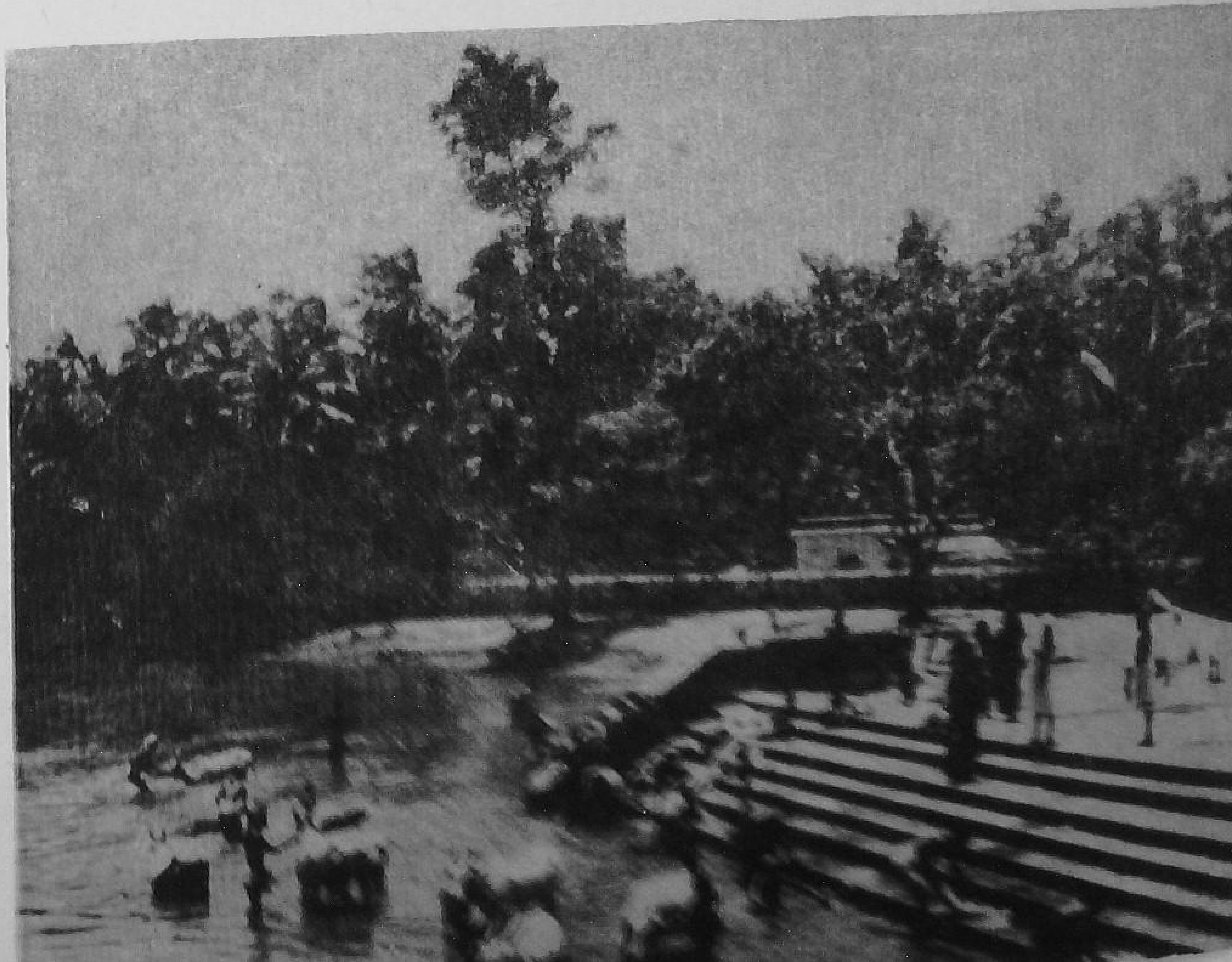
HOW TO PREPARE A SMOKELESS MAGAN CHOOLA.

DESIGN FOR A VILLAGE POND

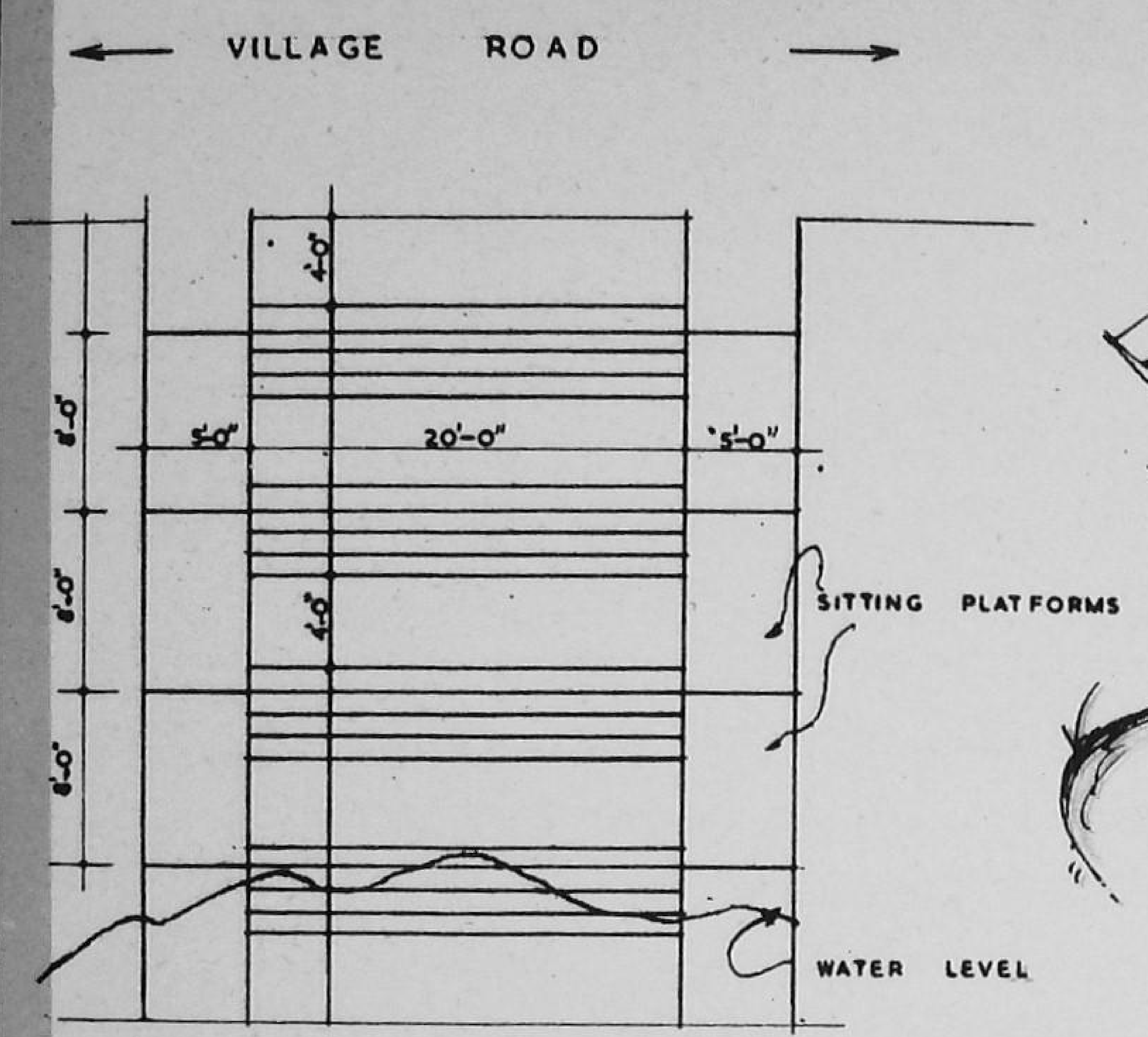


Provision of a few steps and proper platform for washing clothes would be a great amenity for such a village pond.

Plan No. 20 shows the design for masonry steps leading to a pond. The side parapet walls have been designed to serve as washing platforms as well as seats for villagers to sit about in the evening. The length and the number of steps will vary according to actual requirement. Similarly, the depth of foundation also depends upon the local soil conditions. The cost of such an arrangement will depend upon the size of the pond.

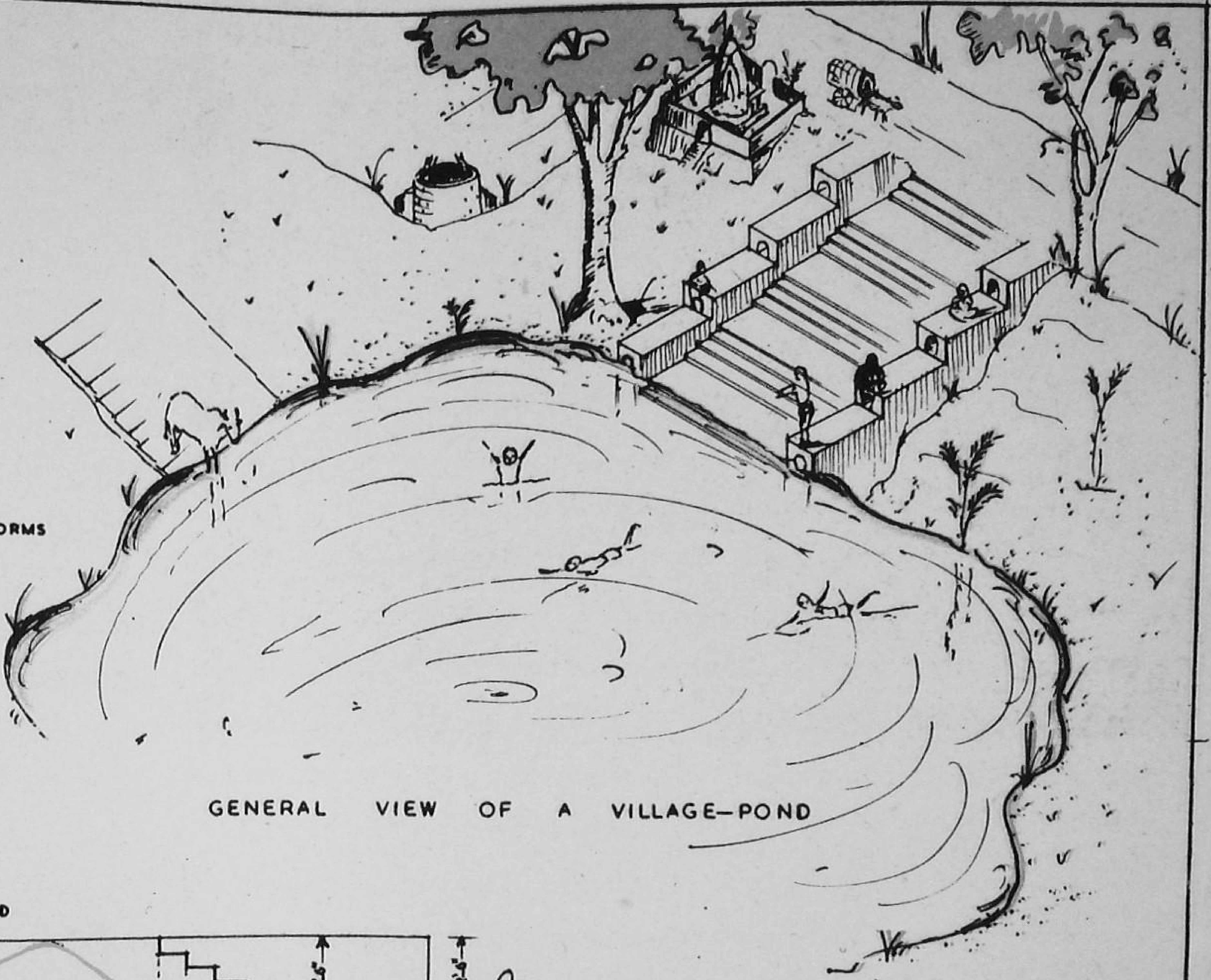


A village pond with stepping arrangement.

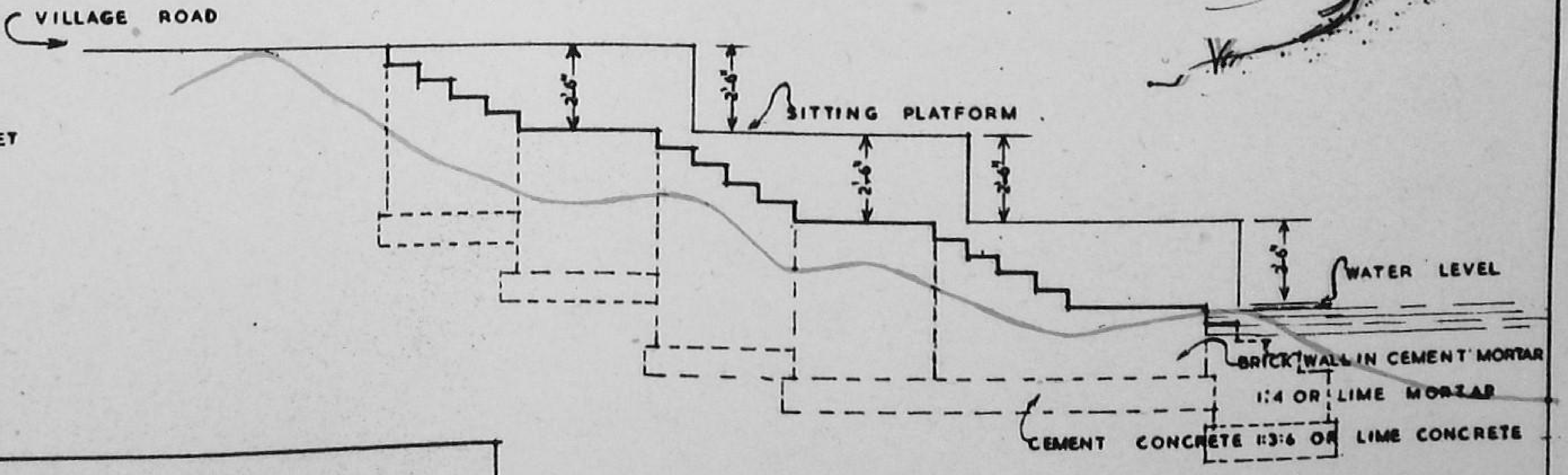


PLAN SHOWING THE ARRANGEMENT OF STEPS

SCALE 0 2 4 6 8 14 IN FEET



GENERAL VIEW OF A VILLAGE–POND



SECTION THROUGH STEPS

SCALE 0 1 2 4 6 8 IN FEET

A VILLAGE POND SHOWING ARRANGEMENT OF STEPS ETC.

DRG. NO. 20.

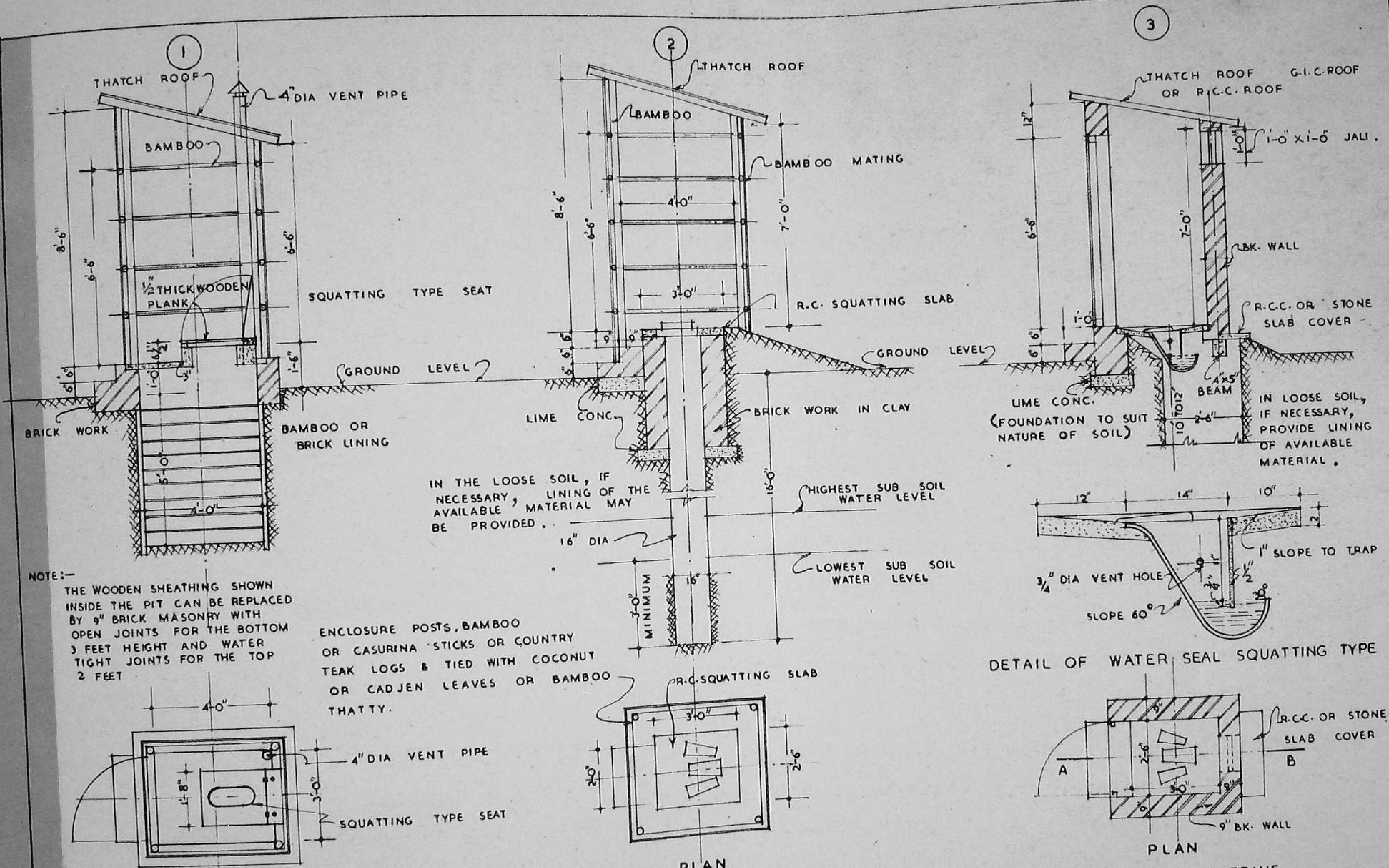
DESIGN FOR A VILLAGE LATRINE

The vast majority of village population in the rural areas live without sanitary facilities; thus increasing the incidence of diseases etc. The provision of cheap and sanitary type of latrines is, therefore, a real necessity. Three type designs for latrines are shown in plan No. 21. Type No. 1 is a *pit latrine* which has a $4' \times 3' \times 5'$ pit for night soil. The cover of the pit also serves as the squatting seat. It can either be of precast concrete slab or of stone slab. Opening of the latrine seat will have to be covered with a 1/2″ thick wooden plank when it is not in use to prevent flies getting in. The enclosed walls of the latrine and its roof can be of bamboo and *chatai matting*; so that they can be shifted when the pit gets filled up. A 4″ diameter vent pipe may be fitted to facilitate escape of hot and foul gases from the pit. This type of latrine would be suitable for hot and dry regions where the rainfall is not heavy. For details regarding the squatting seat, see plan No. 22.

Type 2—*Bore hole latrine:* In this design, 16″ dia. hole is bored into the ground down to a depth of 3′ below the lowest sub-soil water level in the region. In order to prevent the earth caving in, the hole should be lined with local available material such as bamboo matting, earthen rings etc. The top of the hole is covered with the precast concrete slab supported on masonry walls, as shown in the plan. The enclosure of the roof to the latrine can be made of bamboos and bamboo matting.

For details regarding this squatting seat, see plan No. 22.

Type 3—*Dug Well Latrine* : In this design the latrine consists of a pit of size of $2'\text{-}6'' \times 2'\text{-}6''$ and dug 12′ in depth from ground level. In order to prevent the pit from caving in, it can be lined with honey-comb brick masonry or with bamboo or ballies and matting. The special feature about this latrine is that the squatting slab is provided with the water seal arrangement thus sealing off the foul gases. Enclosure walls of the latrine and roof can either be of *pucca* masonry or ballies and mattings and the roof may consist of A. C. sheet or thatch.



BORE HOLE LATRINE

DUG WELL LATRINE (WITH THE COURTESY OF MINISTRY OF HEALTH, GOVT. OF INDIA)

PIT LATRINE (WITH THE COURTESY OF GOVT. OF MADHYA PRADESH)

DRG. NO. 21.

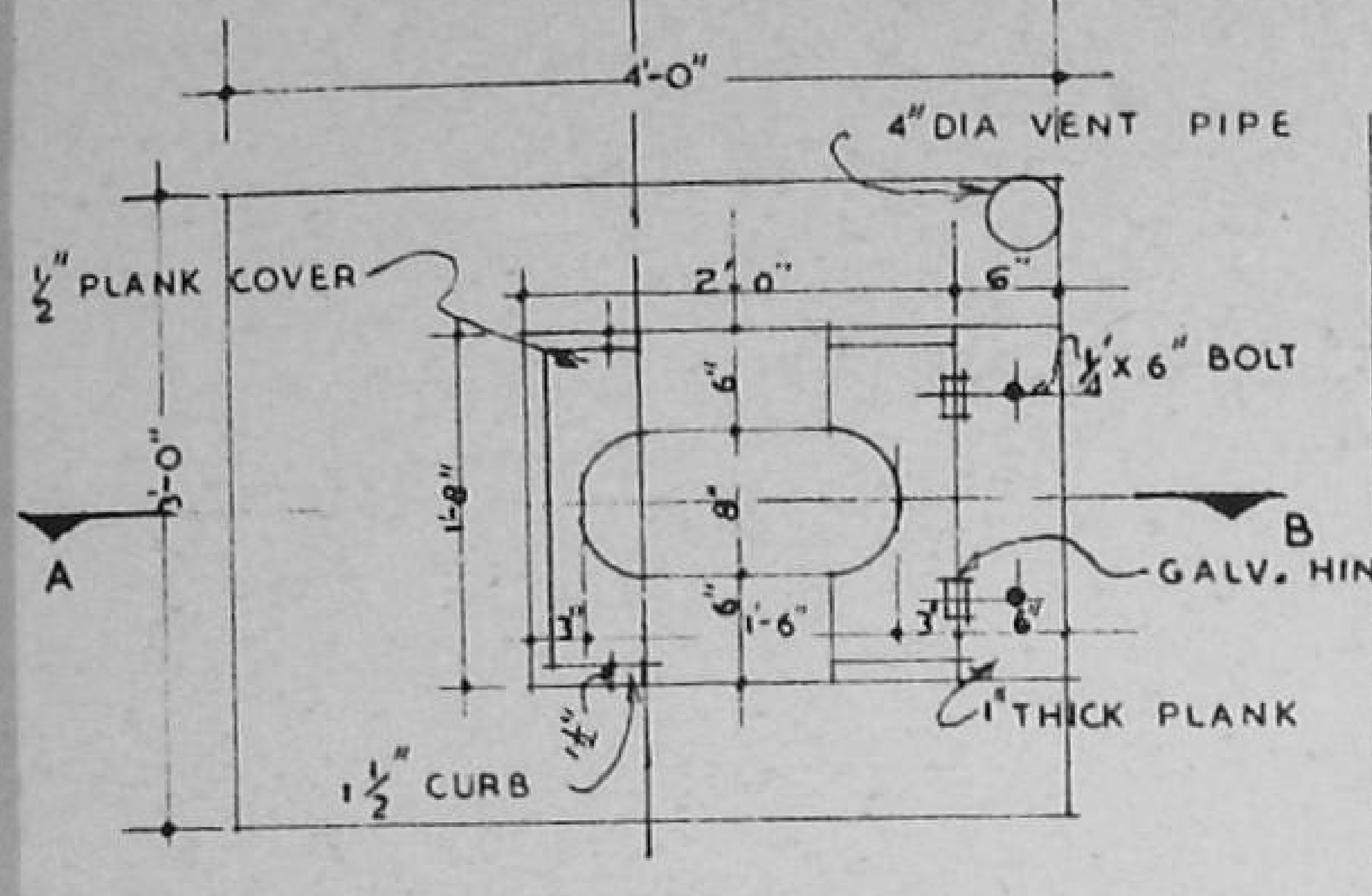
DESIGNS FOR VILLAGE LATRINES

SCALE 3 FEET TO AN INCH

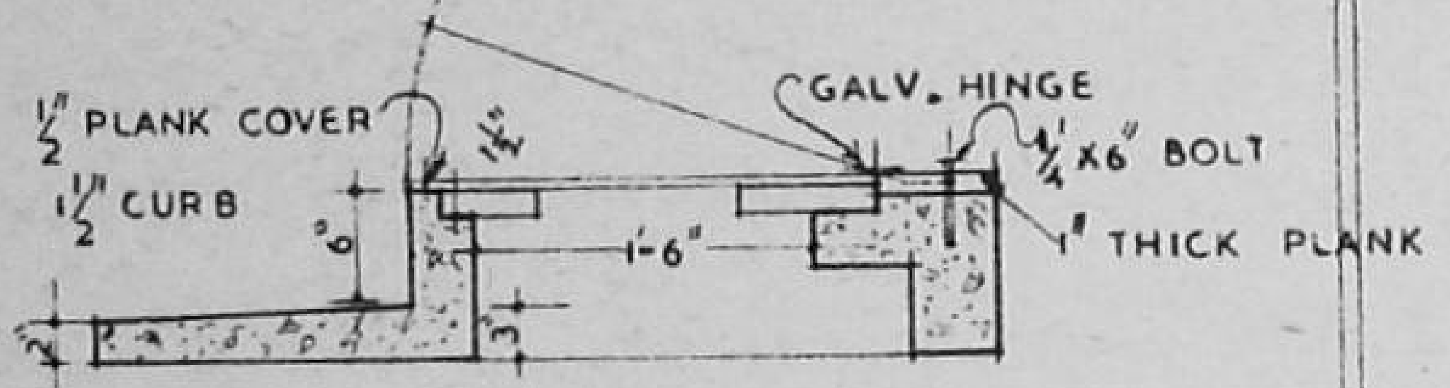
DESIGN FOR COMMUNITY URINALS

Plan No. 22 shows the design for community urinals with soak pits. Squatting precast concrete slabs are provided from which the urine is let to a soak pit through stone-ware pipe. The liquid runs to a pit 3′×3′ ×3 ½′ deep, packed with 6″ layer of saw-dust and 1″ layer of earth alternatively. If saw-dust is not available, wood-coal or dry refuse and leaves may be used. The top of the pit should be covered with a slab. Rapid decomposition of the refuse takes place, attended by decreasing capacity of the humus, to retain further additions of urine. When this condition is reached (say after two or three month's use) the top layer becomes damp and there is smell of ammonia. At this stage, new pit is dug, near the old one, and is filled in a manner described above and then put to use. The first pit is covered with an additional 1″ layer of earth and is allowed to de-compose for a further period of two months, after which the manure can be removed for application to land. When the urinal is properly soaked by lower layers there will be no saturation of the top layer, no smell and no attraction to flies.

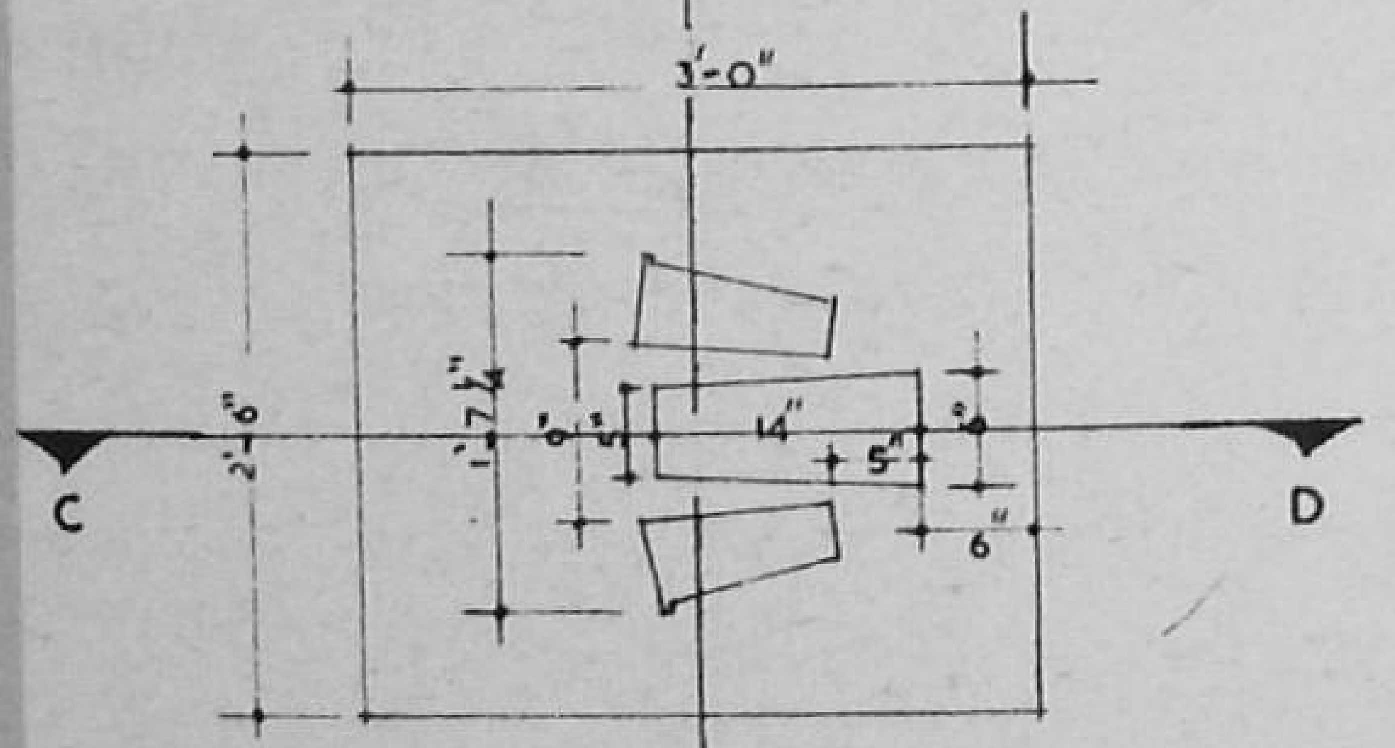
The design of the manure pit is based on the recommendations, of the Compost and Sewage Development Officer, Government of India, Ministry of Food and Agriculture.



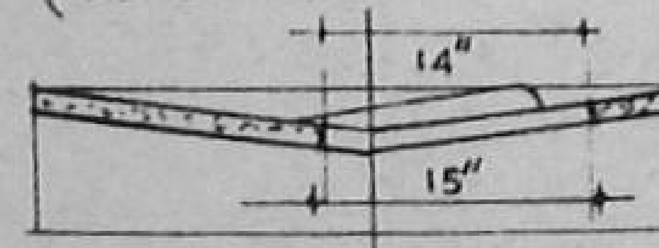
DETAIL PLAN OF CONCRETE SLAB
(OF PIT LATRINE) (1)



SECTION ON AB



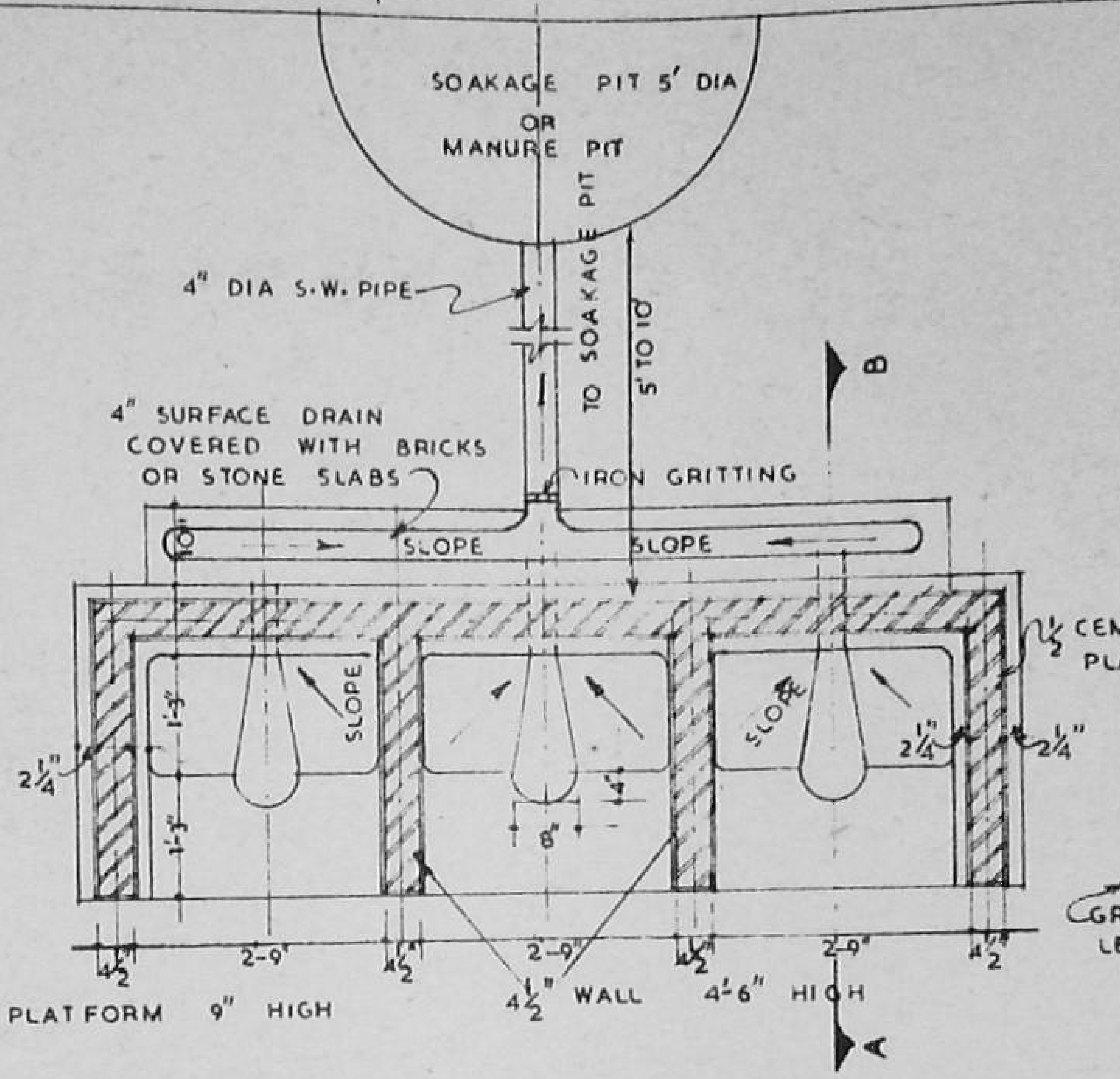
DETAIL PLAN OF SQUATTING SLAB
(BORE HOLE LATRINE) (2) & (3)



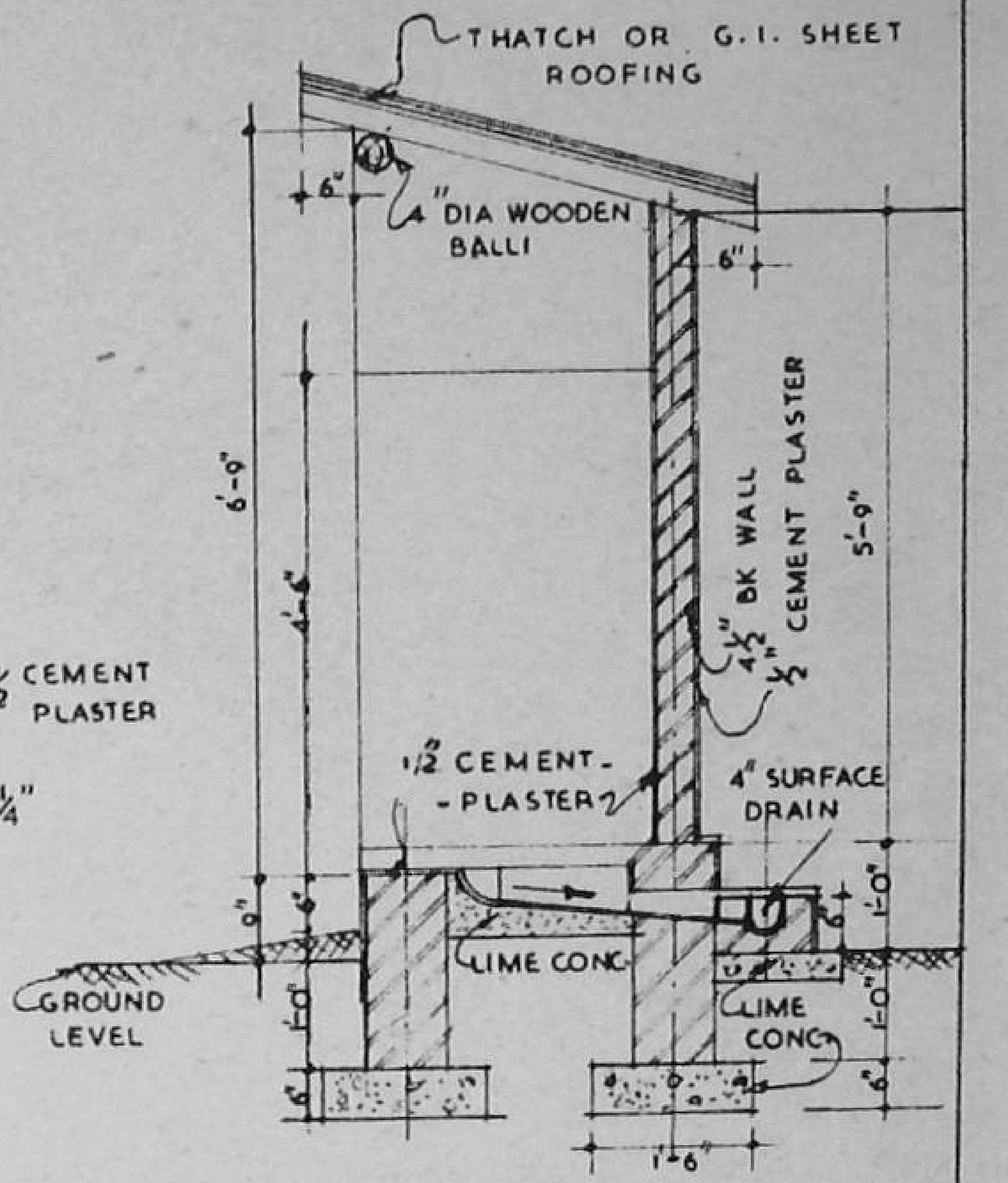
SECTION ON CD

DETAILS OF SQUATTING TYPE SEATS (OF DRG. NO. 21)

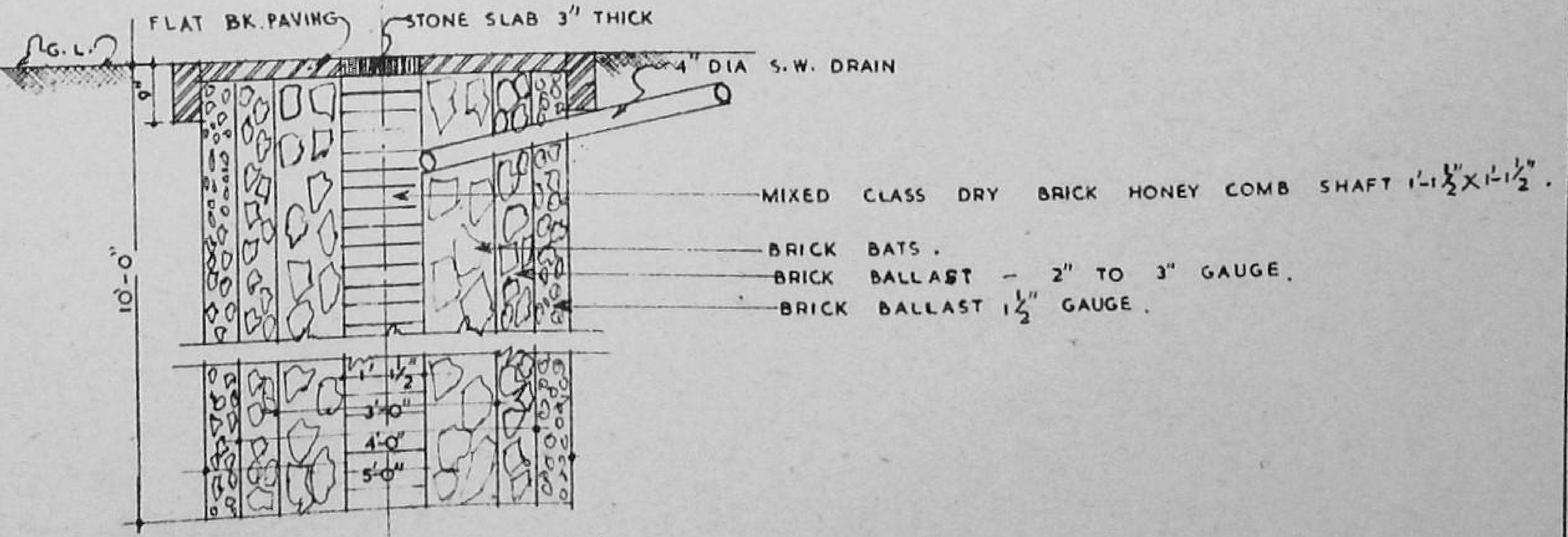
SCALE 0 1 2 3 4 — 1" 2" 3"



PLAN OF COMMUNITY URINALS



SECTION ON AB

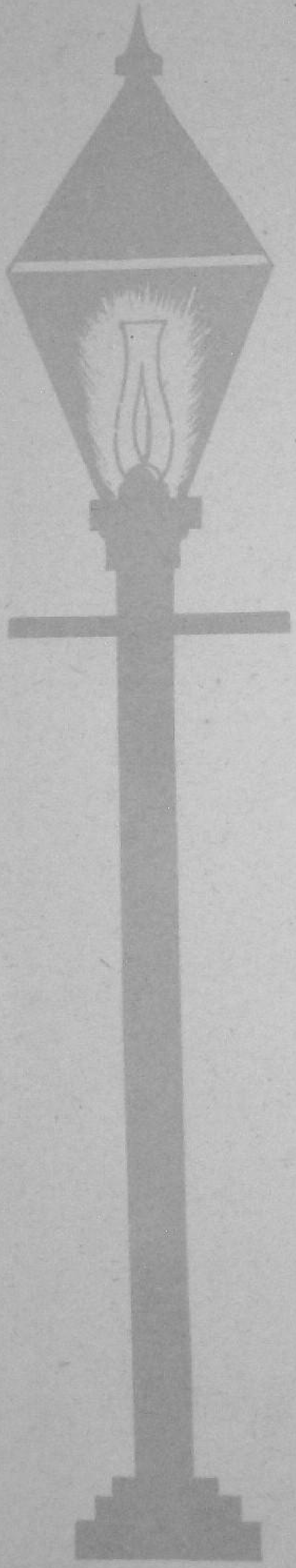


1/2" DETAIL OF SOAKAGE PIT 5' DIA: 10' DEEP

DRG. NO. 22.

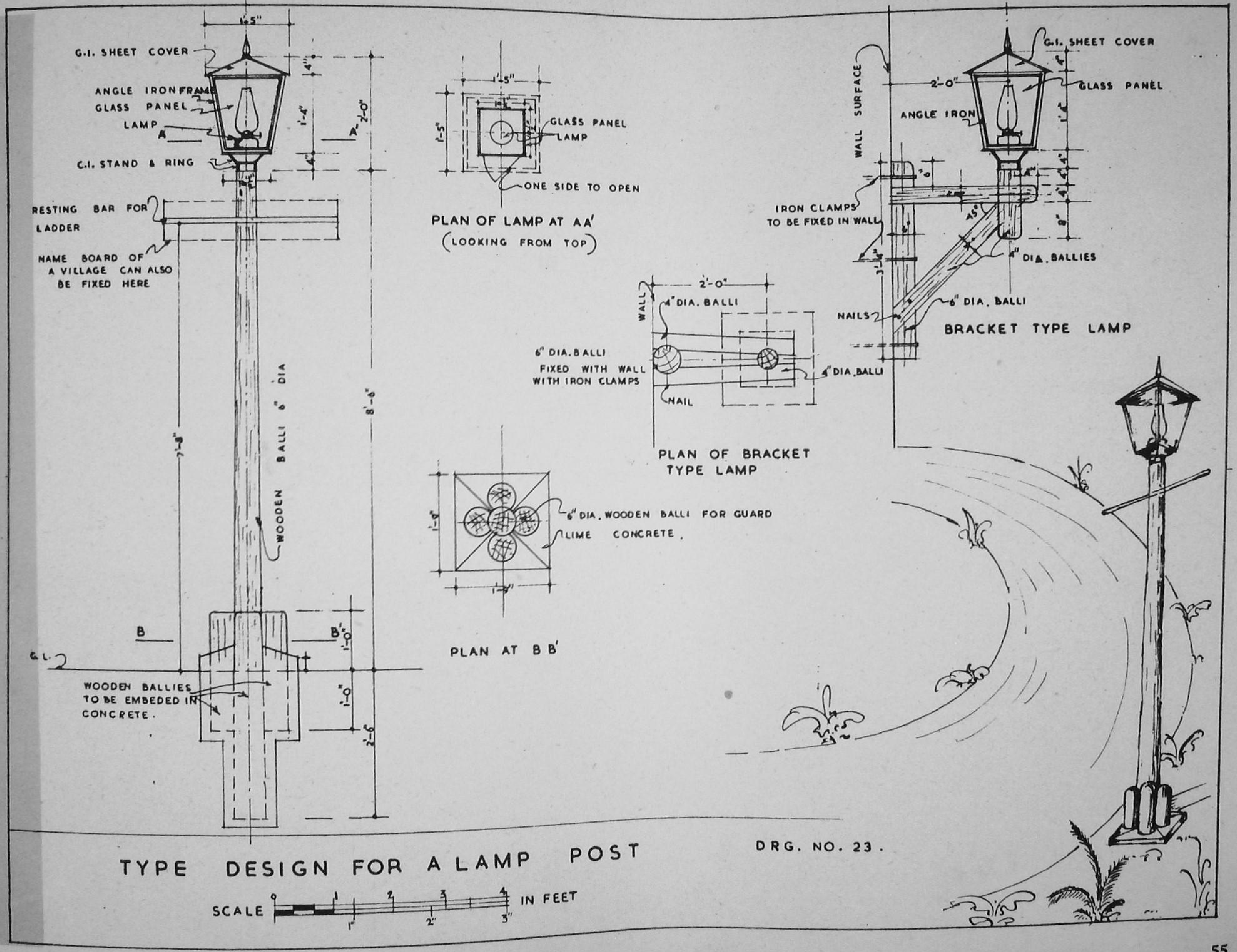
COMMUNITY URINALS AND SOAKAGE PIT

SCALE 0 1 2 4 6 8 IN FEET



DESIGN FOR A LAMP POST

Plan No. 23 shows the design for two types of street light. Where ever the buildings exist the bracket type lamps can be used. At other places lamp stands will have to be provided. The design has been kept simple so that the village craftsman can manufacture both the lamp posts and lamps making use of such local materials as are available.


G.I. SHEET COVER
ANGLE IRON FRAME
GLASS PANEL
LAMP
C.I. STAND & RING
RESTING BAR FOR LADDER
NAME BOARD OF A VILLAGE CAN ALSO BE FIXED HERE
WOODEN BALLI 6" DIA
G.L.
WOODEN BALLIES TO BE EMBEDED IN CONCRETE.
GLASS PANEL
LAMP
ONE SIDE TO OPEN
PLAN OF LAMP AT AA'
(LOOKING FROM TOP)
6" DIA. WOODEN BALLI FOR GUARD
LIME CONCRETE.
PLAN AT B B'
WALL
4" DIA. BALLI
6" DIA. BALLI FIXED WITH WALL WITH IRON CLAMPS
NAIL
4" DIA. BALLI
PLAN OF BRACKET TYPE LAMP
WALL SURFACE
G.I. SHEET COVER
GLASS PANEL
ANGLE IRON
IRON CLAMPS TO BE FIXED IN WALL
4" DIA. BALLIES
6" DIA. BALLI
NAILS
BRACKET TYPE LAMP
TYPE DESIGN FOR A LAMP POST
DRG. NO. 23.
SCALE
IN FEET

DESIGN FOR A TREE PLATFORM

In villages where economic conditions do not permit of a separate building for a community centre, a big shady tree can be made to serve as a centre if a proper platform is provided around it. Plan No. 24 shows the details of construction of such a simple platform. The size of the platform can be varied according to actual requirements.

The approximate quantity of materials and labour required for a platform of 30′ diameter is given below :—

Materials :—

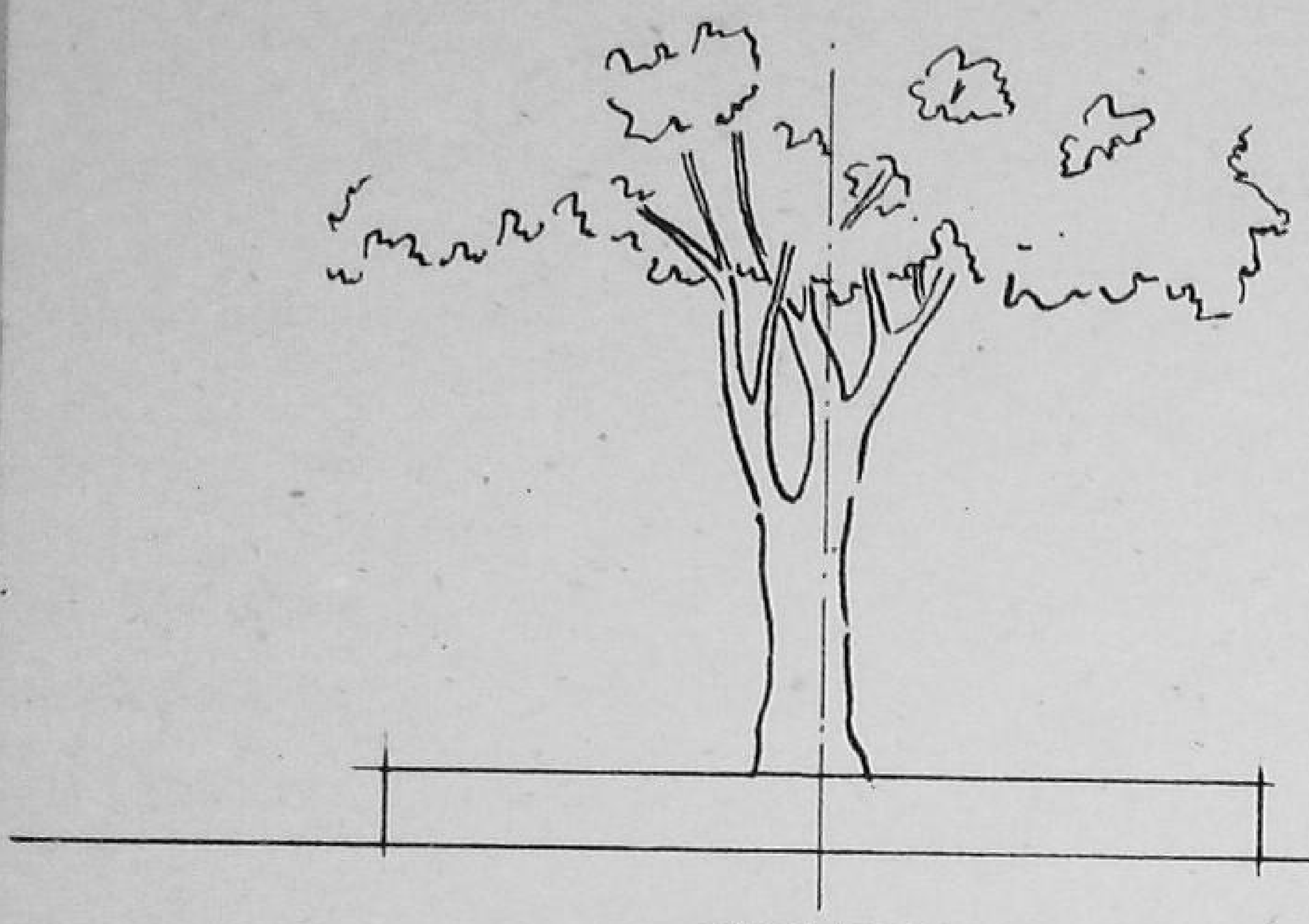
Cement	0.5 tons.
Lime	70 cft.
Sand	250 cft.
Brick ballast 1½″ gauge	70 cft.
Bricks	8,000 Nos.

Labour :—

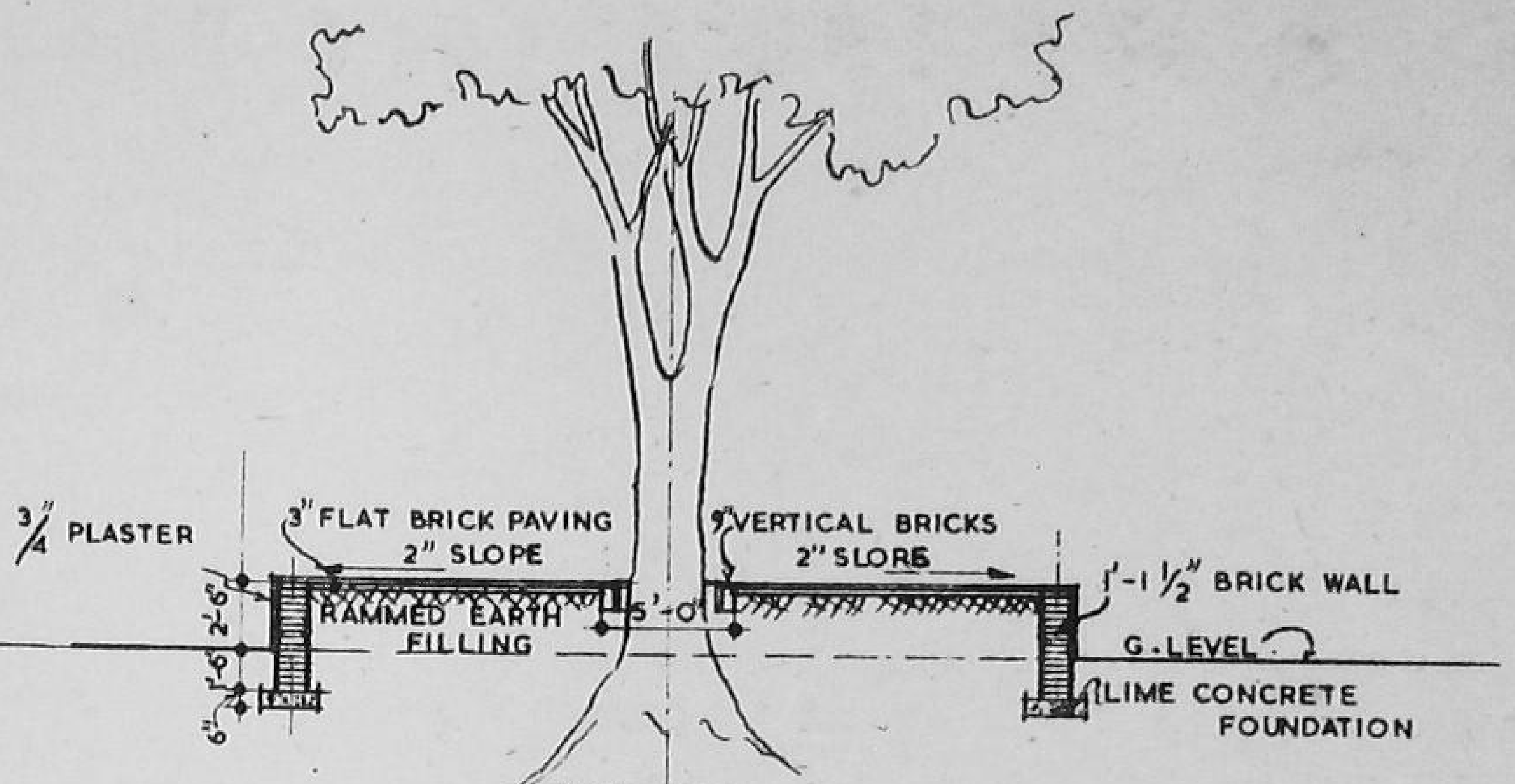
Masons.	3 Nos. for 8 days.
Beldars and coolies	7 Nos. for 8 days.
Bhisti	1 No. for 8 days.

The cost of 30′-0″ diameter platform will vary from Rs. 600/- to Rs. 800/- at different places; for good specifications depending on the local cost of materials and labour. If the labour is provided free by the villagers, the cost will vary from Rs. 300/- to Rs. 400/- for a semi-permanent structure.

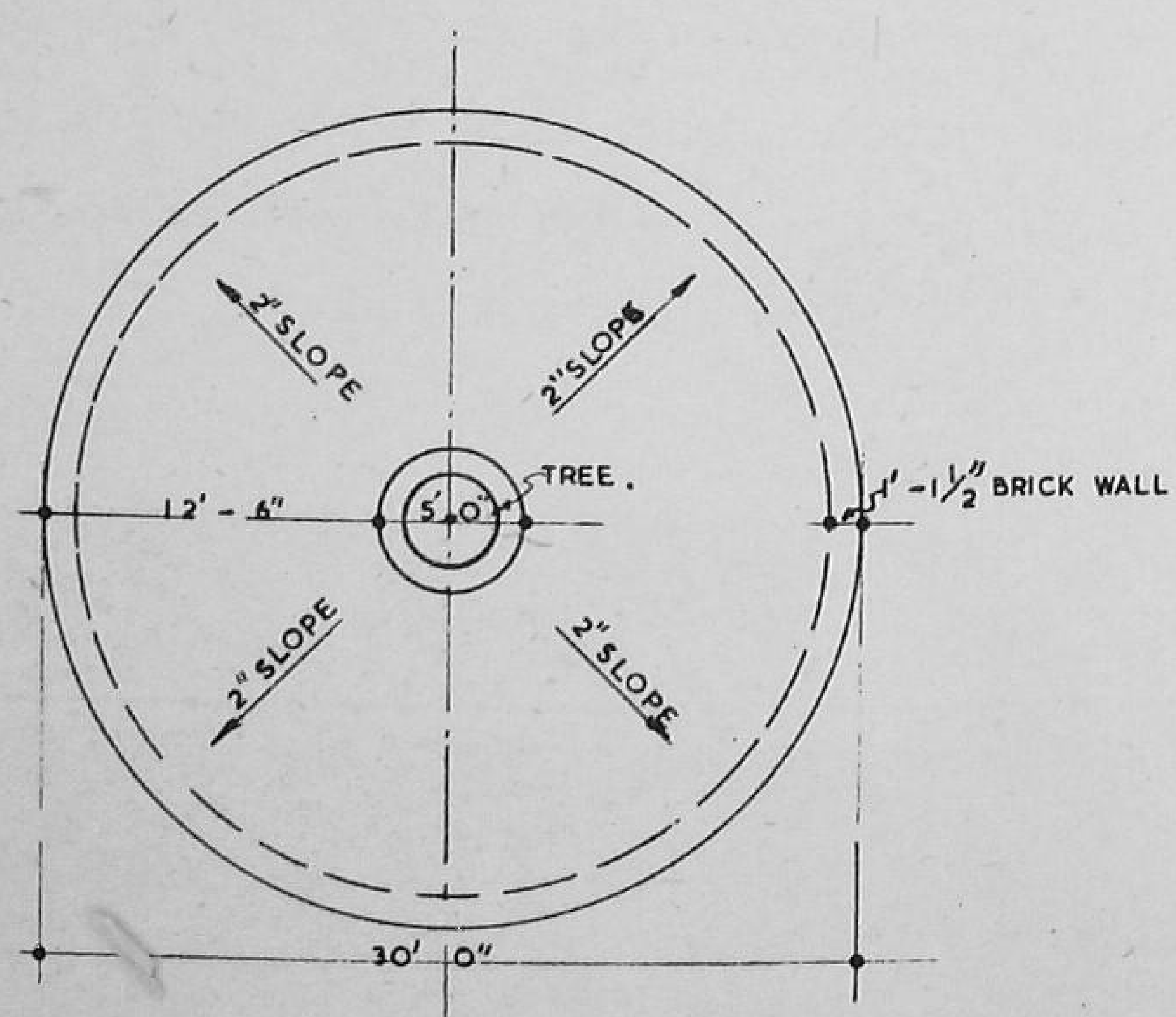
Villagers resting under a big tree. If a pucca round platform is provided, it will increase the convenience of the people who may wish to rest under the shady trees.



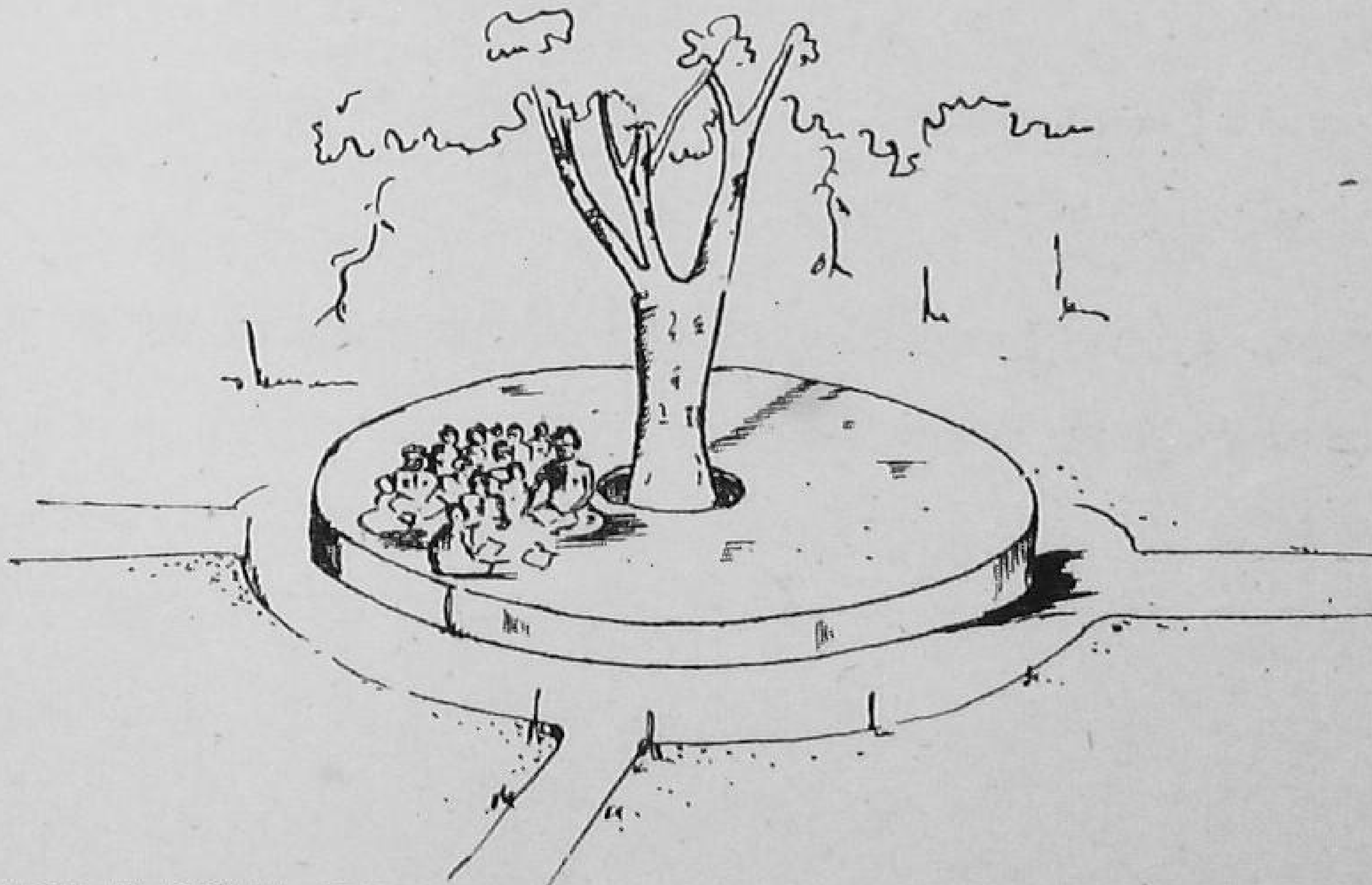
ELEVATION



SECTION



PLAN



PUCCA PLATFORM ROUND THE EXISTING BIG TREES TO ACT AS COMMUNITY CENTRES.

DRG. NO. 24.

TYPICAL PLATFORM FOR A TREE

SCALE 0 2 4 6 8 16 24 32 IN FEET

NOTE :—

25 FEET OR 30 FEET DIAMETER MASONRY-PLATFORM TO BE CONSTRUCTED ROUND EACH BIG TREE, DEPENDING UPON THE SIZE OF TREE. THE MASONRY PLATFORM SHOULD BE OF BRICK WORK IN CEMENT MORTAR. THE TOP AND SIDES PLASTERED WITH CEMENT MORTER — 1 : 4.

SANITARY ARRANGEMENTS AROUND A WELL

The well is, in many cases, the only source of drinking water in the village. It is, therefore, necessary to keep the village well free from pollution.

Plan No. 25 shows the arrangements for keeping the well in a sanitary condition. A parapet wall 3′ high is built around the well above ground level to prevent dirt and rain water getting into it from the adjoining ground. The *pucca* masonry platform is built around the base of the well so that spilt water can flow into the circular drain provided at the perimeter of the platform and then led down to an open ground or a soak pit through a system of herring-bone type of drains. Provision has been made for four persons to draw water at the same time by means of buckets. A cattle trough has also been provided as shown in the plan. One foot high masonry platforms have been provided round the well to keep utensils. The cost of this platform etc., will vary from Rs. 600/- to Rs. 800/- at different places, for good specifications depending upon the local cost of materials and labour. If the labour is provided free by the villagers, the cost will vary from Rs. 300/- to Rs. 400/-

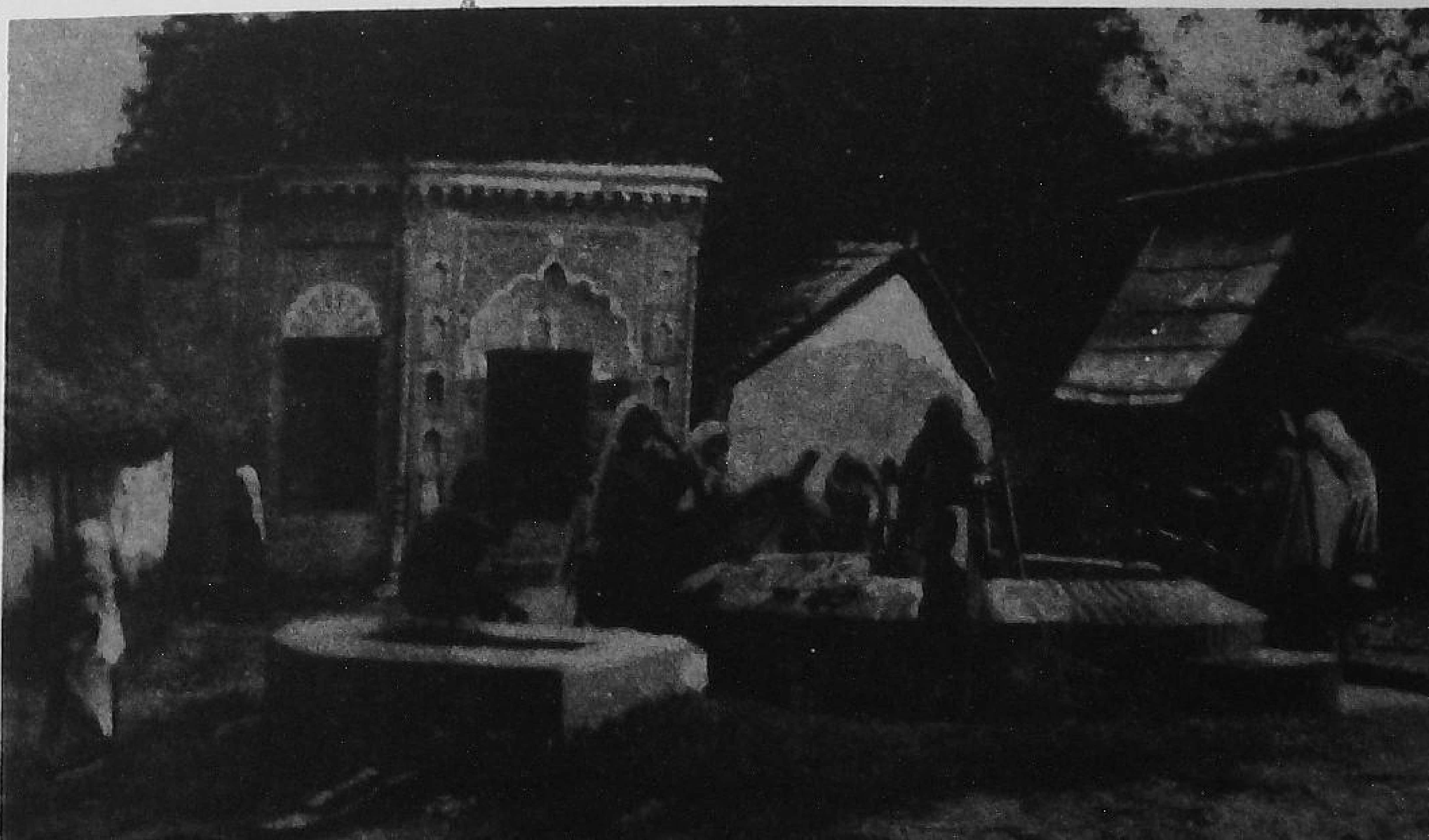
The requirement of materials and labour for this is given below :—

Materials :—

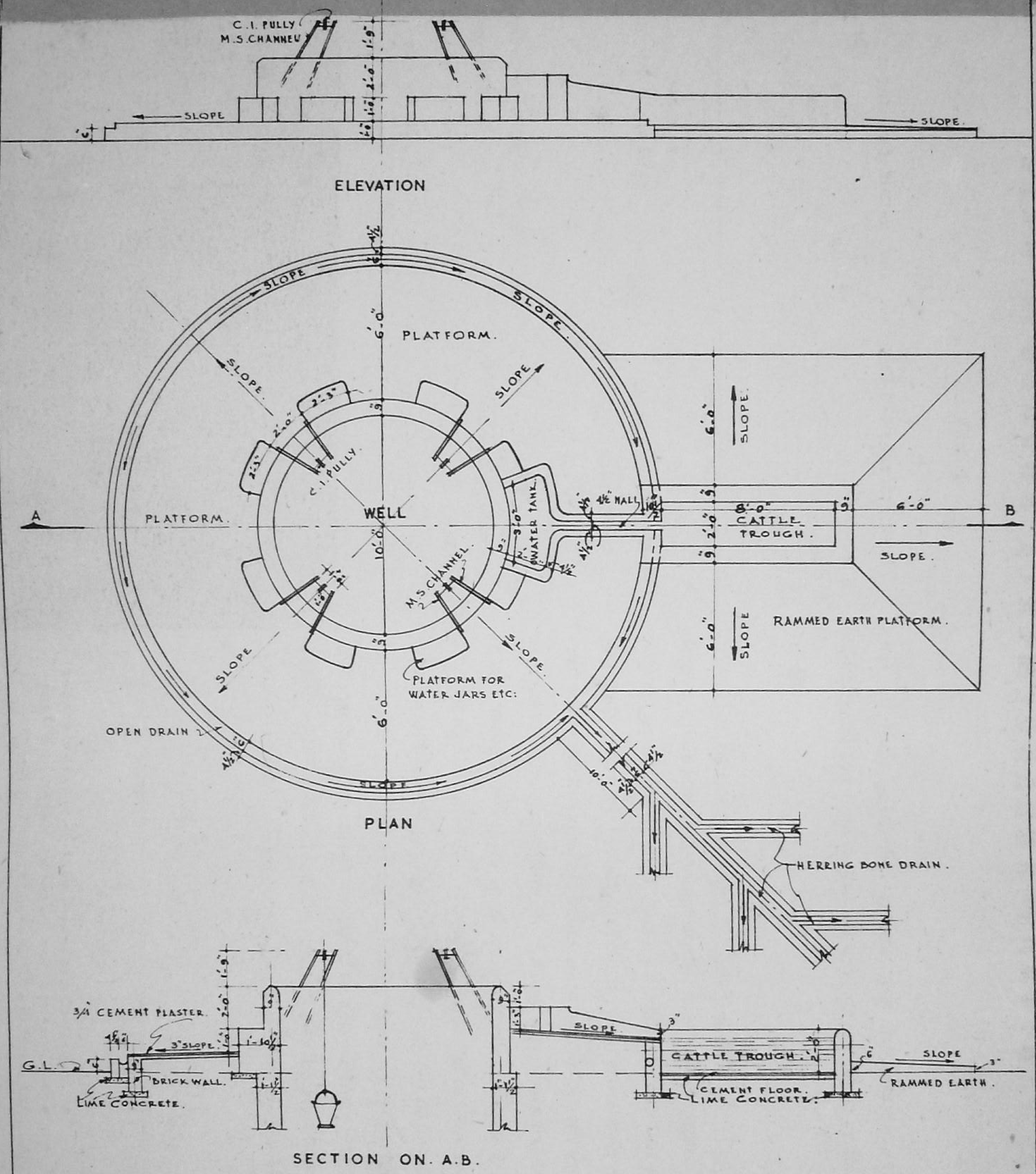
Cement	0.8 tons.
Lime	50 cft.
Sand	250 cft.
Brick ballast 1½″ gauge	150 cft.
Bricks	5,500 Nos.
Stone ballast ½″ gauge	5 cft.
M. S. channels and pullies	4 Cwt.

Labour :—

Masons.	2 Nos. for 10 days.
Beldars and coolies	4 Nos. for 10 days.
Bhisti	1 No. for 10 days.
Blacksmith	1 No for 1 day.
Fitter	1 No. for 1 day.



An improved sanitary well - see the proper arrangements for drawing water and soakage pit for disposal of waste water.



DRG. NO. 25.

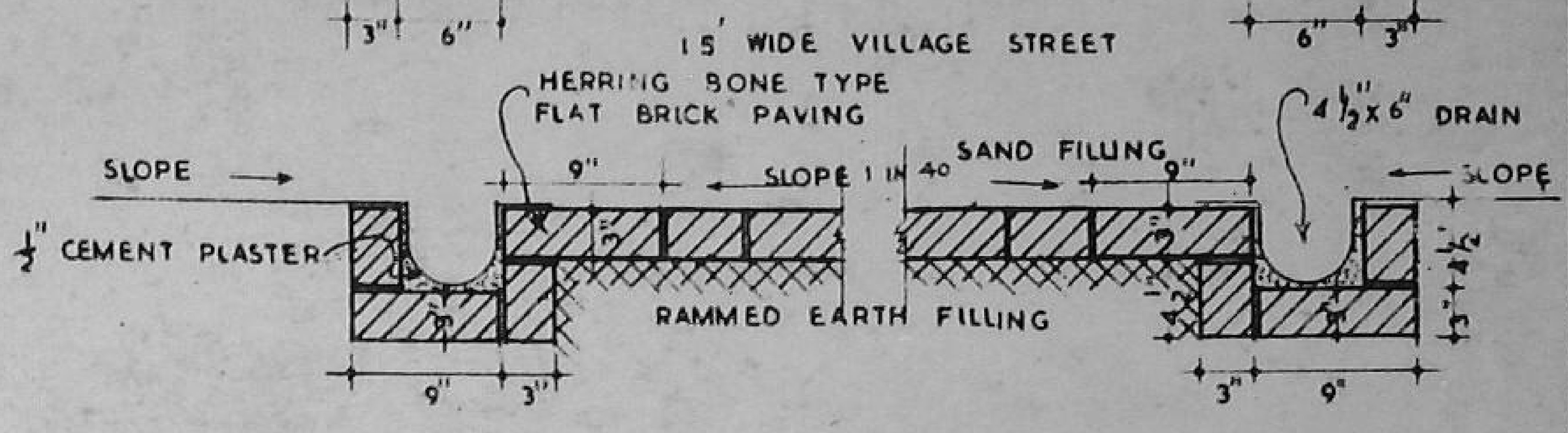
TYPICAL PLATFORM FOR A WELL
(WITH A CATTLE-TROUGH)

SCALE 0 1 2 3 4 8 12 16 IN FEET.

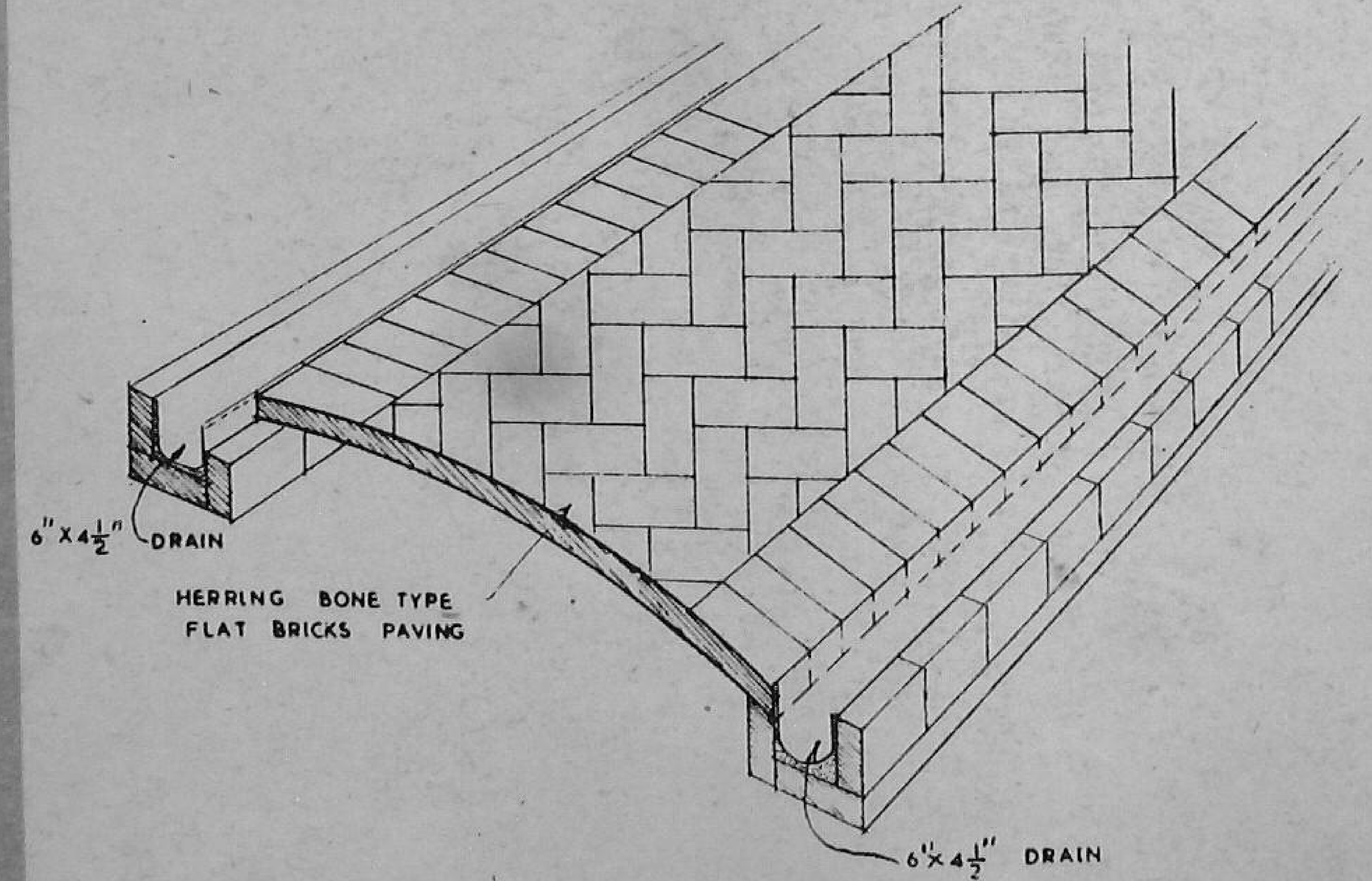
REF. R.C./W.H.S. 6/6 JANUARY. 1954.

ASSTT. ARCHITECT. HOUSING ADVISER.

MINISTRY OF WORKS, HOUSING & SUPPLY
GOVT. OF INDIA. NEW DELHI.



TYPICAL CROSS SECTION THROUGH A VILLAGE STREET & DRAINS



NOTE :—

(1) THE DRAIN SHOULD BE ROUNDED AT THE BOTTOM WITH CEMENT CONCRETE 1:2:4 & FINISHED WITH PLASTER 1:3 INCLUDING A FLOATING COAT OF NEAT CEMENT

(2) THE BRICK PAVING MAY BE REPLACED BY STONE WHERE IT IS CHEAPLY AVAILABLE

(3) QUANTITIES OF MATERIALS AND LABOUR FOR A STANDARD WIDTH OF 15'-0" AND 100'-0" LENGTH.

MATERIALS	LABOUR
CEMENT 8 CWT.	BELDARS & COOLIES 8 NOS. FOR 4 DAYS.
SAND 125 CFT.	MASONS 4 NOS. FOR 4 DAYS.
BRICKS 6300 NOS.	BHISHTI 1 NO. FOR 4 DAYS.
STONE BALLAST ½" GAUGE 5 CFT.	

DRG. NO. 26

PAVING & DRAINS FOR A VILLAGE STREET